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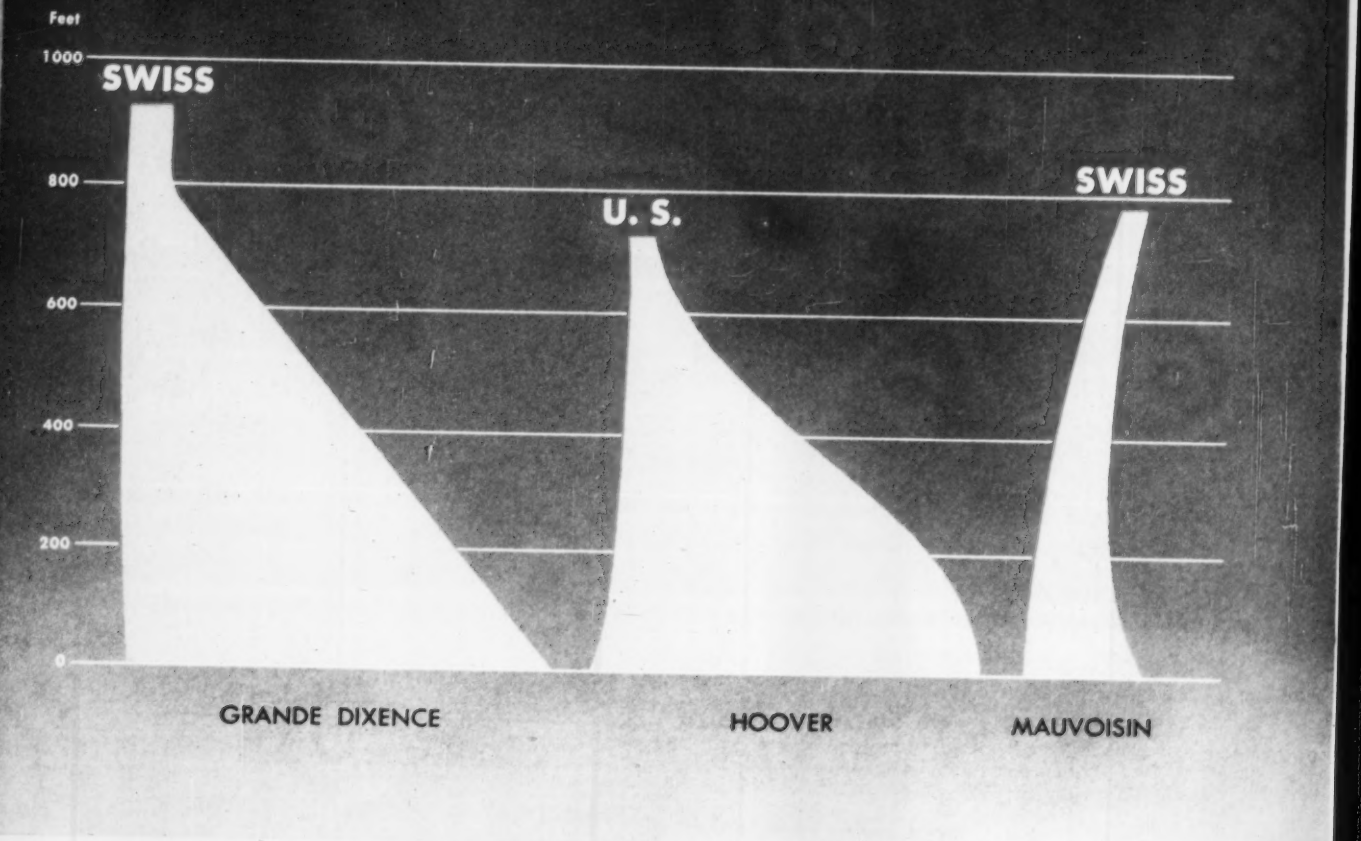

U.S. to lose high dam leadership p. 34

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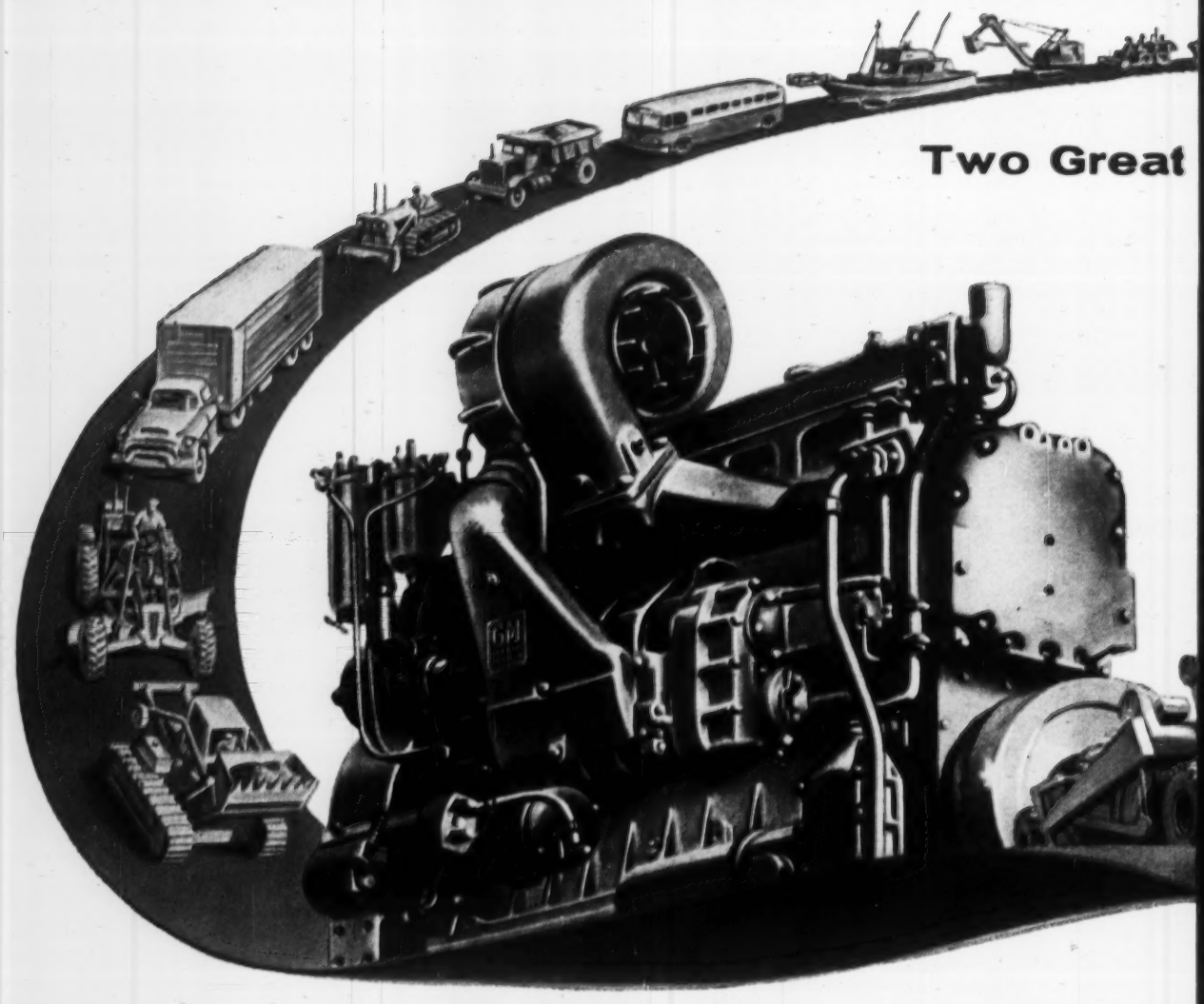

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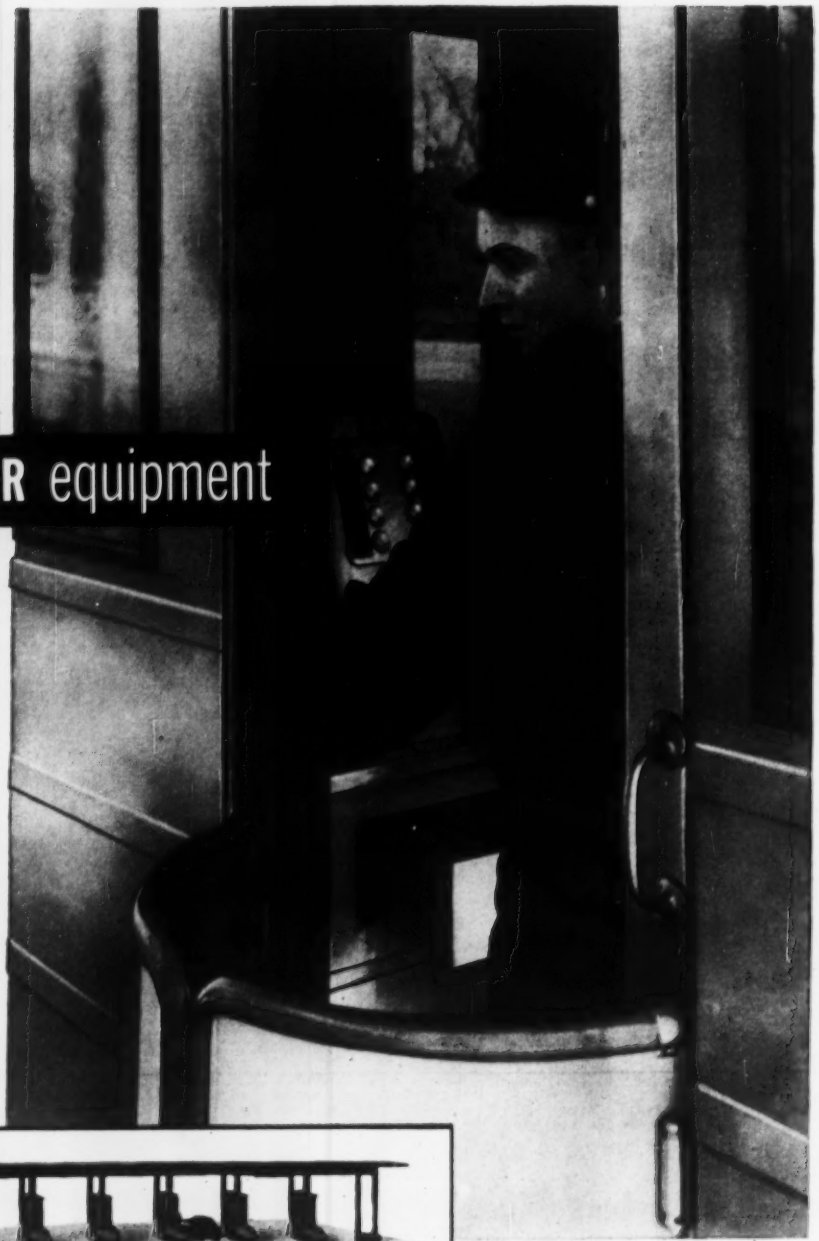

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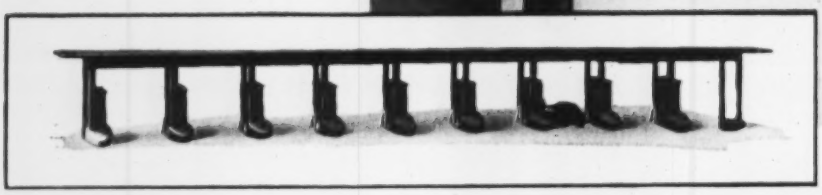

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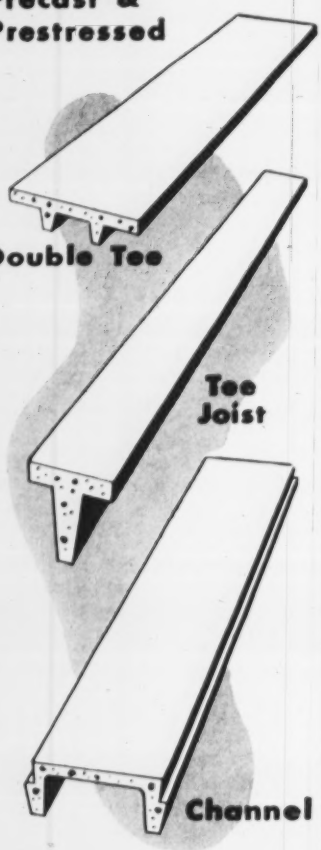

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Reader Comment

Record in Lives Lost

SIR—I agree with you that Japanese dambuilders deserve great praise for Apr. 19, p. 38). I do not agree with the significance you place on achieving world records.

Several words, part of one sentence, in the Sakuma article, cause me to challenge the basic philosophy of world-shattering records,—"Although a fatality total in the neighborhood of 150 casts a cloud on working conditions".

These words should be the lesson in big-league dambuilding. Sure, my company wants to set records, earthshaking records—in safety. But we do not concentrate on records for record's sake, but rather focus all efforts toward saving human lives.

Just think—150 lives lost! Probably untold numbers of serious injuries. Would it have been possible, by extending the completion date 75 days, to have saved 2 lives a day? What a record to dangle in front of the eyes of the construction world. Yet, it does appear that by any method of evaluation, the Japanese did outdo their American tutors on the Sakuma dam project.

JOHN H. KIRACOFE
Engineer, Standard Oil Co. (Ohio)
Lima, Ohio

Shortage of Engineers

SIR—Admittedly there is a shortage of engineers which if not corrected may vitally effect national defense, even national survival. The President of the United States has issued a warning. The lay and technical press have discussed the matter no end. Scientific and engineering manpower commissions have labored with the problem. Salaries for green engineering graduates have been raised to dizzying heights. The wide opportunities for engineering employment are reflected by seven pages of want ads in a recent issue of the New York Times. In the face of all this promotional activity, the fact that the shortage shows very limited signs of abatement may indicate that as engineering is practiced today it does not appeal to our youth who are seeking a worktime environment where inspiring human relationships and human values afford the background for day to day conduct.

Speaking in Pittsburgh at an ASME meeting a few years ago, the then mayor of St. Louis—himself an engineer—expressed the opinion that an outstanding weakness of the profession is that engineers individually do not "sound off" enough. Shortly thereafter I asked the wife of a distinguished engineer whether she "sounded off" on occasion. "Yes, I do," she replied, "but Sam does not. He says, 'How can I if I do not have the facts'"? Sam's attitude is quite in accord with the best engineering traditions. The lightsome remark and the give and take of informal discussion are all but unknown at engineering meetings.

And yet throughout history, great events have been precipitated by geographically widespread, and sometimes vociferous, "sounding off" by peoples possessing only negligible information normally required to reach engineering decisions. Though only rarely included in engineering dicta, political, social and even nationalistic attitudes have the power to inspire the hearts and minds of men.

A speaker at a recent meeting of the German Engineering Society where "The Human Being in the Field of Force called Technology" was discussed gave a bleak picture of engineering as "an ascetic training where moods, prejudices and abstractions have no place." But if the engineer has labored faithfully he admitted, "his creation stands before his eyes—as a tree or a rock—like the objects of Nature herself."

However, the speaker then noted nothing comparable to the practice of engineering in other sectors of human society. In the courts of justice, in economic discussions, in politics and even in the churches there were constant informal and sometimes violent debates where presumably the participants were motivated by common underlying principles. The speaker as a finale puts Caesar at the Rubicon. To cross or not to cross? The decision is to be wholly personal and not inhibited by the laws of nature. So Caesar crosses and establishes and heads one of history's great imperial dynasties.

(*Continued on page 10*)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York, 36, N. Y.

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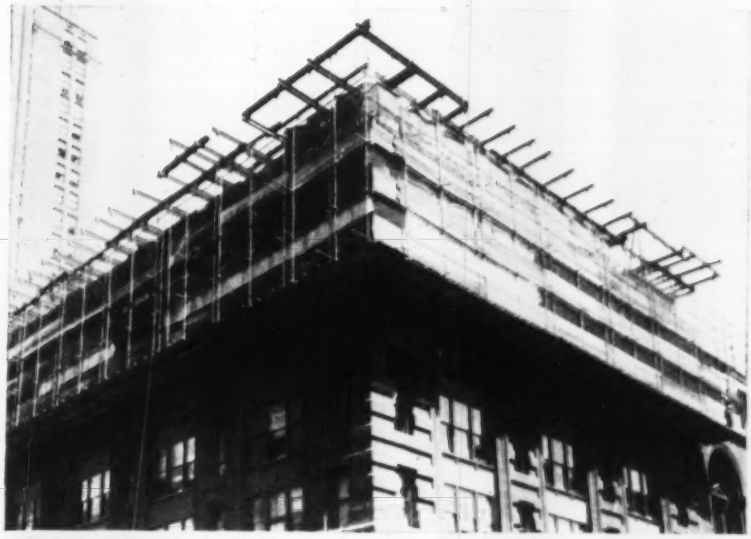
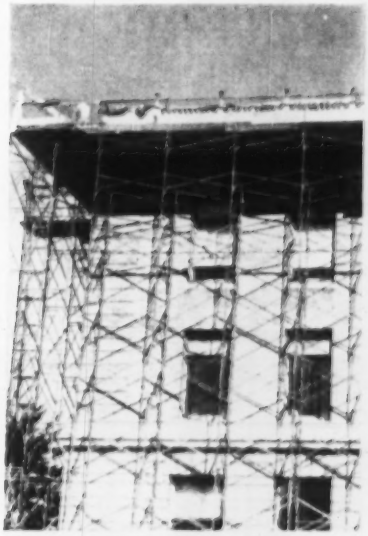
Scaffolding Methods . . . for Cornice Removal

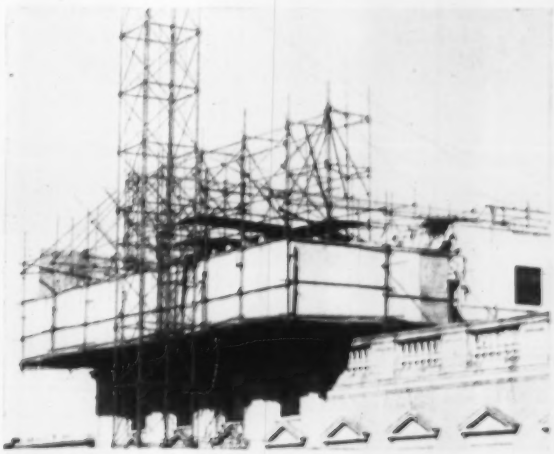


ROOF SUSPENSION—3-level hanging "TubeLox"® Scaffold, with protective "Gold Medal" Sidewalk Bridge, helps in removal of the wide overhanging cornice and terra cotta ornamentation extending a full story and a half down from the top of the First National Bank Building in Chicago. Peter Masterson Co., contractor, exposed the top flange of the roof beams and PS Co. anchored 7" double outrigger steel I-beams to them with double beam clamps. 8,500 lineal feet of "TubeLox" Scaffolding, with canopy, suspends from the outrigger beams to provide three working levels.



FROM THE GROUND—This 350-frame "Trouble Saver"® Sectional Scaffold, built up from the ground for cornice removal on Simmons College, Boston, is used on this low building because it was the most economical and practical method. Hew Const. Co., contractor. U.L. approved.

HANGING TO THE JOB—"Gold Medal" Suspended Scaffold Machines are hung from double 7" I-beams attached at roof level for this decoration removal job on the America Fore Building, Chicago. Clarence Cross Co., contractor, finds this method to be safe and efficient in moving workmen from level to level quickly. U.L. approved.



CANTILEVER—To remove cornice from the tall Clift Hotel, San Francisco, a unique scaffold made of 11,000 lineal feet of "TubeLox" Scaffolding is cantilevered over the parapet. The scaffold is tied back each bent by roof hooks, cables and turnbuckles. Phoenix Simpton Co., contractor, also tied a 240' "Gold Medal"® Heavy Duty Hoist Tower into the scaffold and building.

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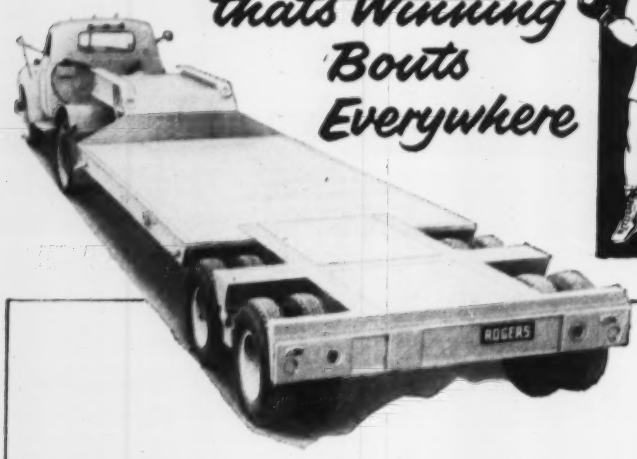

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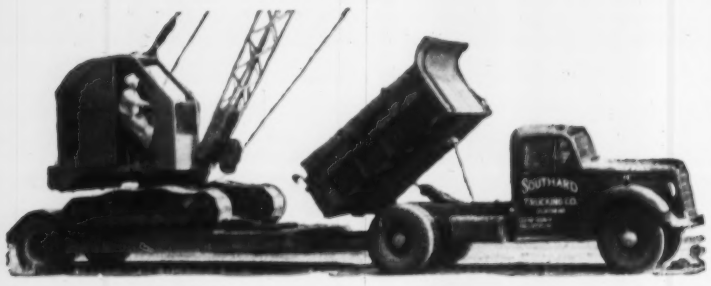

Truck bed being raised to connect Tagalong Trailer.

. . . Reader Comment

Cannot engineering escape the confines of the laws of nature? Yes, but only if we have leaders and teachers who know more than the laws of thermodynamics and such like, men who love beauty and have the imagination to envision a human society where man is set free, men who preach and practice ethical conduct and know that God is the one unassailable and continuing concept. If during one whole week, say some Engineers' Week, each of the 400,000 engineers in the U.S.A. "sounded off" on favorite themes and then did something about it, the country would be better off, the profession of engineering would find itself and youth would flock to our standard.

MORRIS LLEWELLYN COOKE
San Juan, Puerto Rico

Pile Story Not Fully Told

SIR—In the article, "Tests Tell H-Pile Story," appearing in ENR Apr. 5, p. 90, the pious hope is expressed that foundation engineers may someday be able to determine the length of friction piles and their bearing capacity without recourse to field tests. To this we can all say amen and hallelujah—but not because of the test results reported in the article.

It would seem by inference that the research conducted in the Chicago area heralds the approach of that day and that something monumental has been disclosed. It is presumed that the complete results will be made available and then properly evaluated. Upon such contributions the understanding of the complex of pile foundations can be advanced.

The first three conclusions, in the brief summary of results, may be dismissed by their obvious nature. In the following conclusion, a correlation of values is indicated. It would be interesting to learn how the correlation between shear strength as determined by laboratory tests and by strain-gage measurements was established.

It is a widely known and commonly accepted fact that in soft clays the action of a pile, as it penetrates into the ground, effects almost a complete remolding of the soil immediately adjacent to the pile, and the shear strength is reduced to a fraction of the original. If the instrumented pile was driven to refusal in bed rock, it is difficult to believe that only 14% of the applied load was transmitted to the pile tip. Either the pile did not reach rock or it met refusal in dense material, and therefore it could not be said to be a point bearing pile.

(Continued on page 14)

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Small gasoline engines have their place. It is not in heavy-duty service. It costs money to monkey around with one on a job it's not built for. In the long run, a Sheppard Model 17A more than pays for itself. Write for complete information and specifications on this amazing new Sheppard Diesel today.

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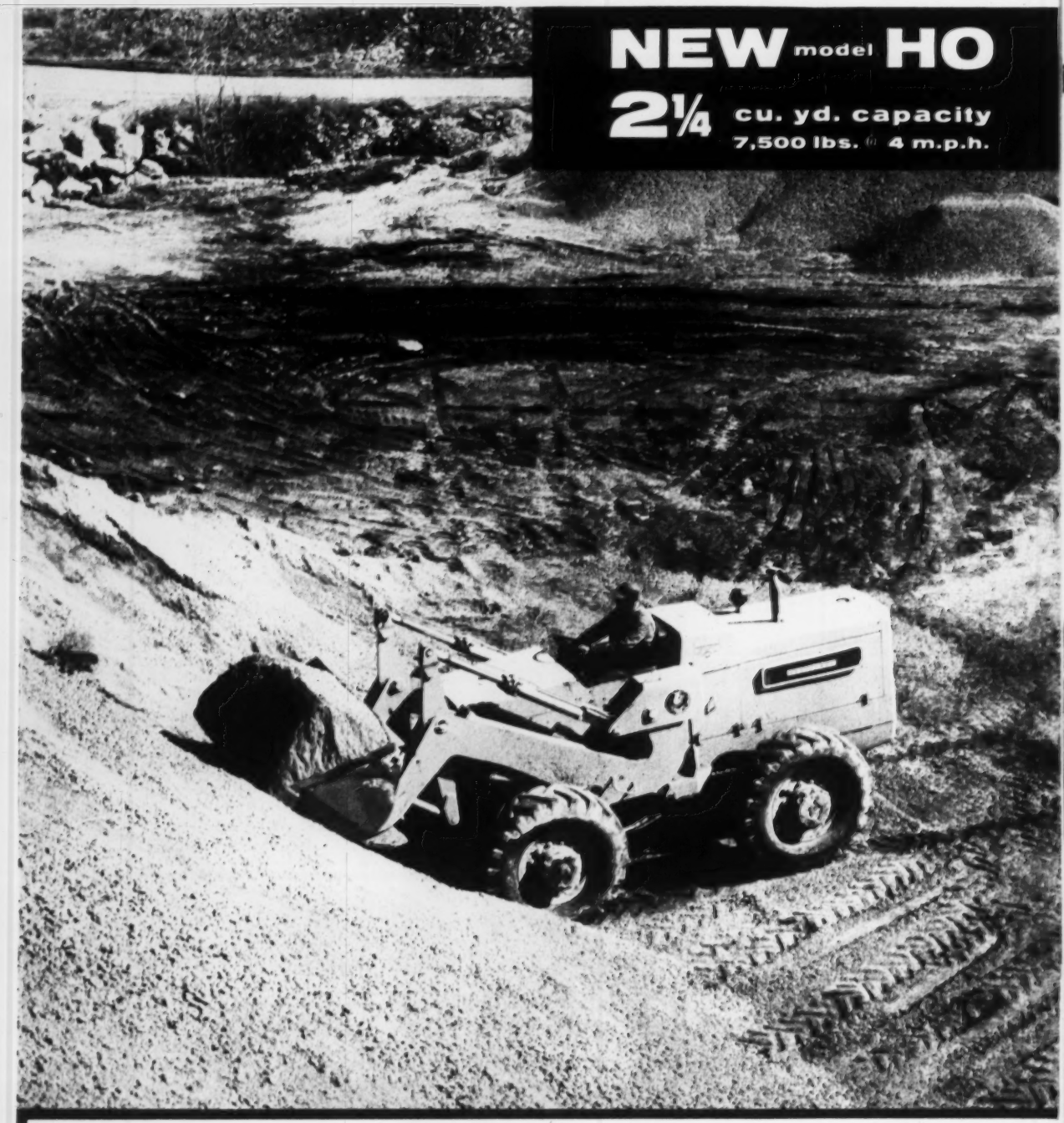

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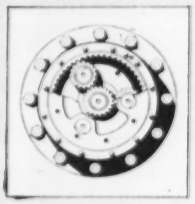
Torque-proportioning differentials, an exclusive feature, assure effective traction under slipping conditions. If one wheel starts to slip, more power is delivered to the opposite wheel. Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing, keep torque low in axles . . . prolong life of axles and all drive train parts.



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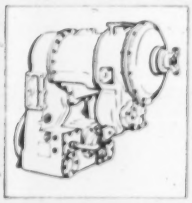
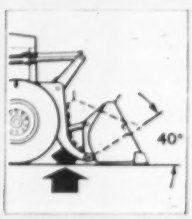
The fastest and easiest-operating transmission you've ever seen. All shifts can be made instantly on-the-go, under full engine speed. There's no stopping for a RANGE shift, there's no foot clutch. With the forward-reverse control, the operator can "creep" the machine at full engine speed, in any gear, while maintaining full bucket action . . . all this, plus torque converter drive.



Tremendous pry-out action and 40° tip-back at ground level

Special pads are provided on the bottom of the boom arms to give ground support for powerful pry-out action. Load forces are also absorbed by the pads, relieving the axles and wheels of these strains. The bucket can tip back 40 degrees, before raising, to get heaped loads even in shallow cuts and low piles and to retain heaped loads.



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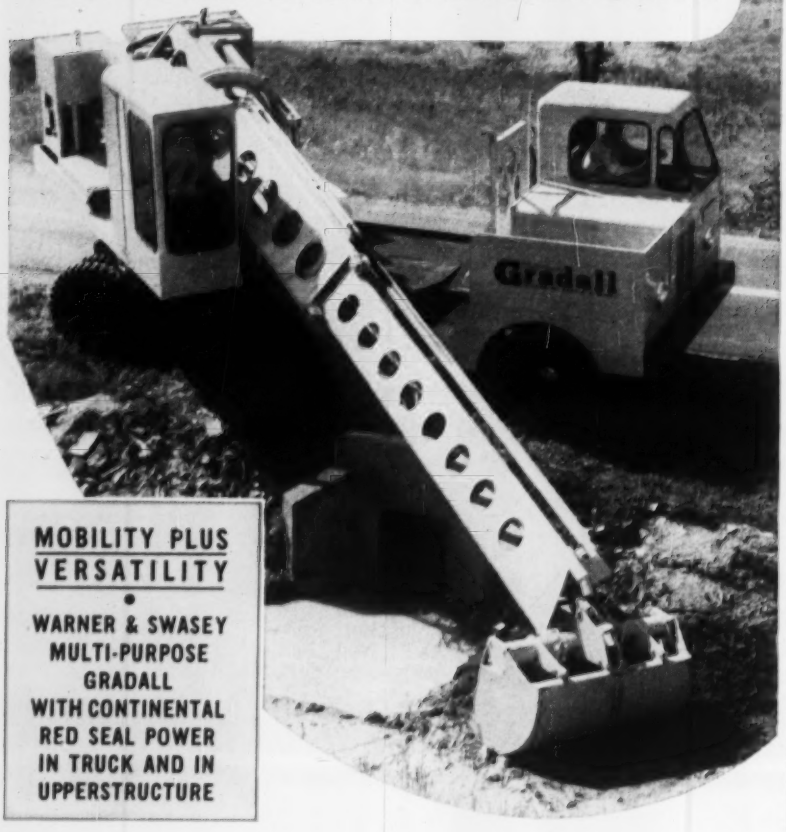

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. . . Reader Comment

The last conclusion regarding the transfer of load from the pile to the soil does not specifiy whether the pile was point bearing or friction.

The resistance of soils under dynamic loads is two to five times larger than the resistance under static loads. Since soil resistance is intact only at the pile tip, where no remolding has taken place, it would appear that frictional resistance along the pile sides would be negligible. However, the side resistance was fully developed in the tests in the remolded condition of the soil. Hence, a paradox!

After a certain time the remolded clay next to the pile would acquire, by thixothropic phenomena, a strength larger than that of the natural soil. Then, the reverse effect with respect to load transfer would be observed.

Because of the great variety of soil types and their large range of strengths, the steps necessary to complete a foundation design will, for some time to come, be based on a comprehensive knowledge of the soils, their properties and history. The designer would need to know, from tests, how long a pile he can use, what would be its bearing capacity and its lateral and uplift resistance. All his estimates previously made must be confirmed or denied by field tests. In addition, he must evaluate the action of a group of piles as differing from that of a single pile. Finally he must use a reasonable factor of safety, common sense, judgment and never rely on the results of the Engineering News formula.

E. J. ZEGARRA
Soils and Foundation Engineer
The M. W. Kellogg Co.

CALENDAR

National Society of Professional Engineers, Ambassador Hotel, Atlantic City, N. J., May 23-26.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 28-June 2.

Wire Reinforcement Institute, annual spring meeting, The Greenbrier, White Sulphur Springs, W. Va., May 28-30.

Steel Joist Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 29-30.

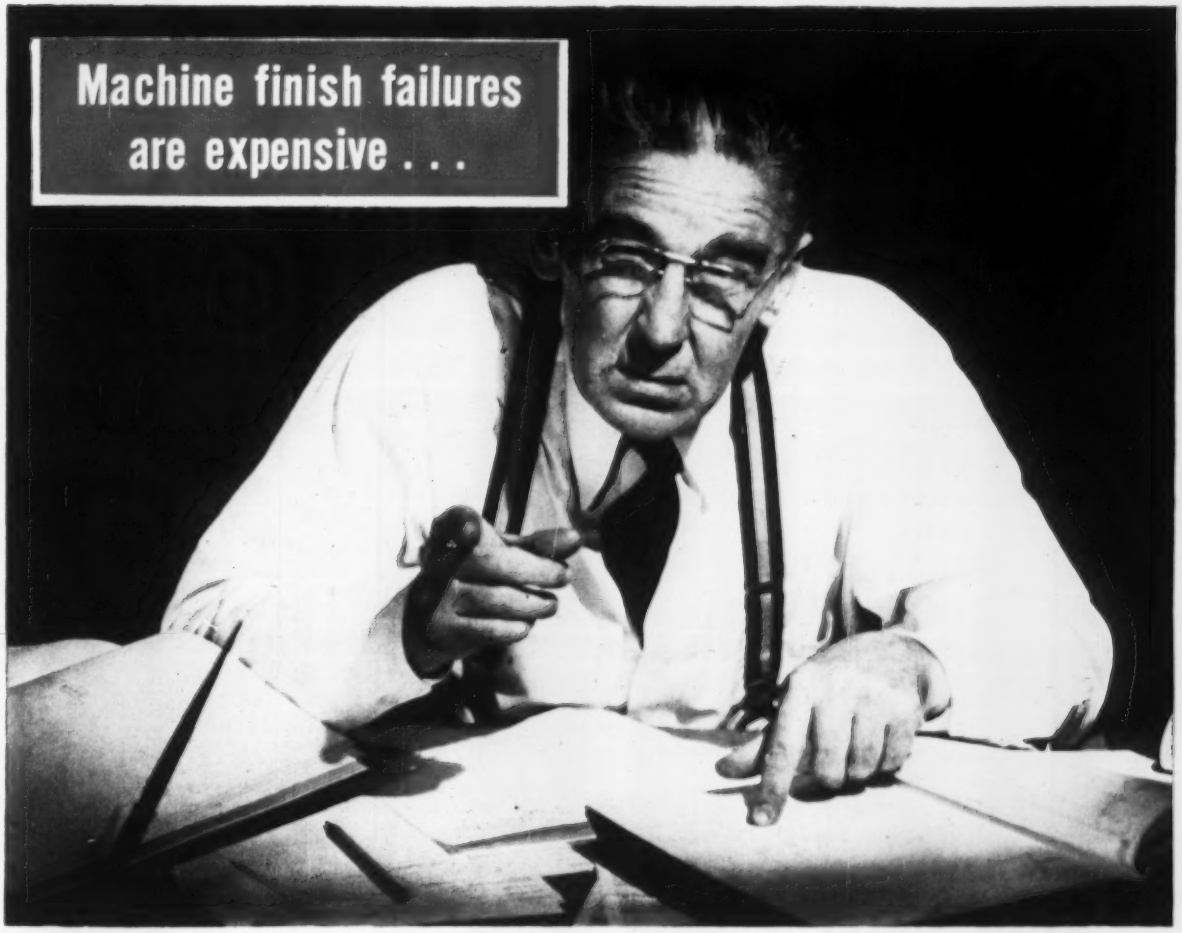
American Society of Civil Engineers, spring convention, University of Tennessee, Knoxville, Tenn., June 4-8.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.



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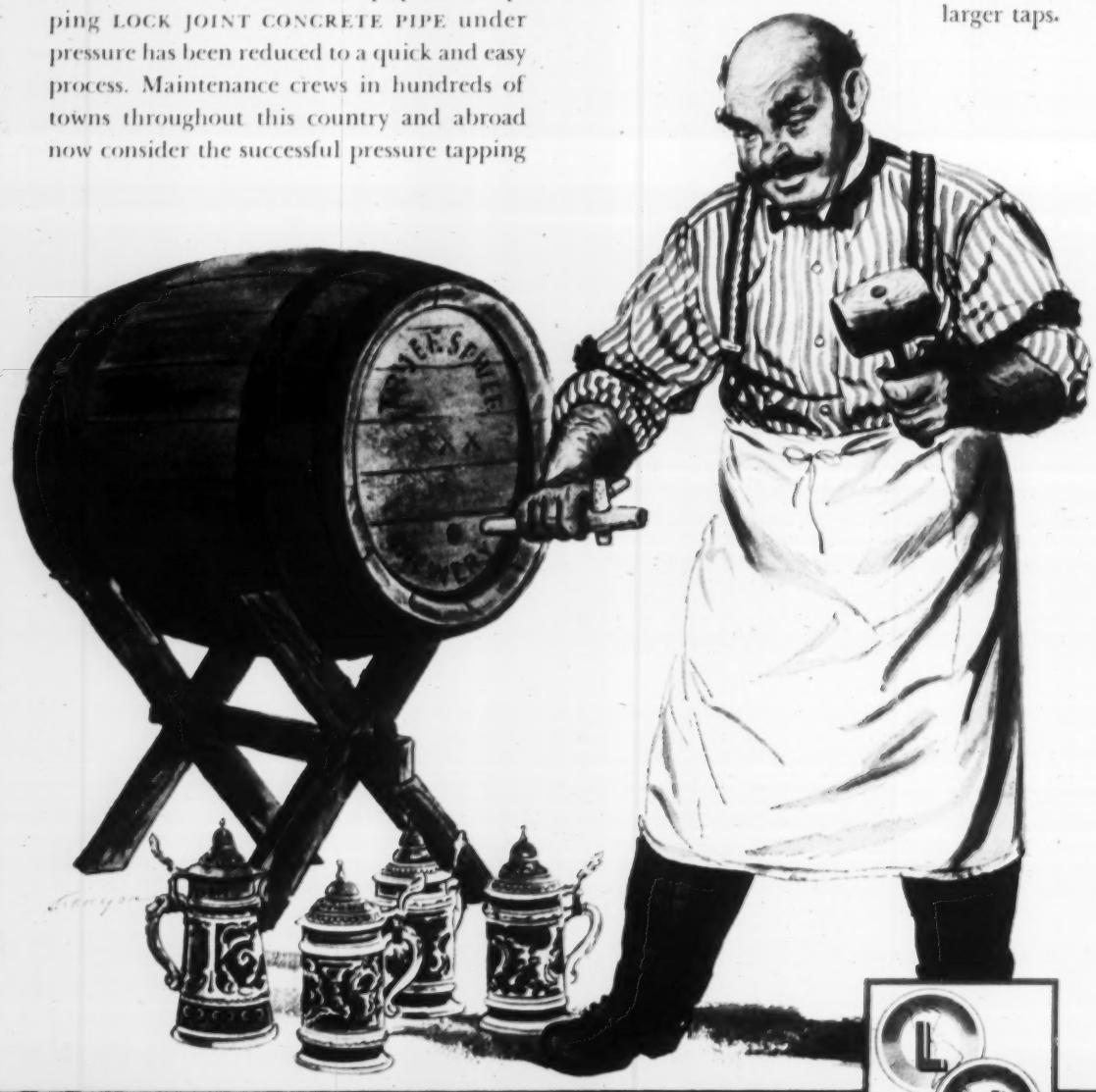
Upon request, we would be glad to send you our brochure covering the few simple steps required either for making service connections or for making larger taps.



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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

SUPER-BOOM HITS A SNAG—Heavy construction awards will bear watching. Private work slumped sharply in the last two weeks. While this may be only a breather in the boom, it may also be a reflection of tight money, materials shortages and rising costs. Private housing is averaging less than $90 million per week compared with $130 million a week last month and $162 million in May '55. Commercial awards continue to decline for the fourth consecutive month. However, the tremendous volume of new projects proposed during the first four months means there's plenty of work to come if conditions are right.

SUBS GET A HELPING HAND—An effort to improve the lot of subcontractors by getting their work inspected and accepted faster and by lowering the amount of general contractors' customary retainage was launched last week by the National Association of Credit Men. A resolution adopted at its annual congress, meeting in Cincinnati, pledged the credit men's group to work for revision of laws, codes and contracts in the interest of getting more favorable payment terms for the subs. The credit men will work with the AIA, AGC and other such organizations in the undertaking.

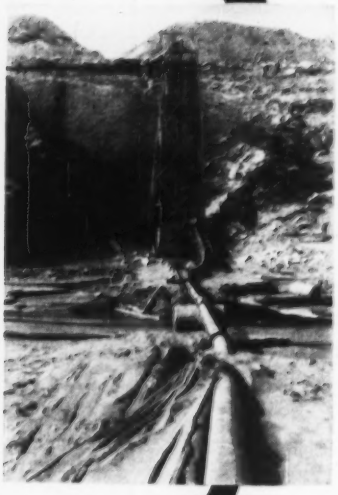
NAME CHANGE—The Pacific Coast Building Officials Conference finds that its name no longer corresponds to the scope of its activities. With more than 800 cities in 40 states, Alaska, Hawaii and Canada having adopted its uniform building code, it will be known as the International Conference of Building Officials, effective July 1.

RULING ON OFF-STREET PARKING—Establishment of off-street parking facilities by cities in the State of Washington is held to be a proper exercise of their police powers. But, in ruling on this point, the state's attorney general conceded that there are doubts as to whether the municipalities can condemn land for the purpose. He recommended that a state legislative enactment clarify the point.

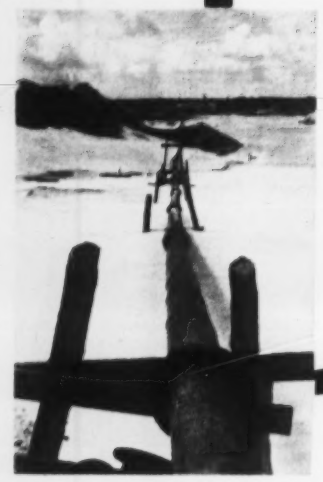
PAYROLL VS. POLLUTION—A planned pulp and paper mill to cost an initial $60 million—and to employ 400 to 600 initially—has received a discharge permit from the South Carolina State Water Pollution Control Authority. Some 90,000 lb of BOD in kraft and semi-chemical wastes would be reduced by Bowaters Southern Paper Corp. to 45,000 lb, largely through oxidation ponds, then discharged near Van Wyck to the Catawba River, Class B stream with an average flow over 4,000 cfs but a minimum flow in summer dropping to 700 cfs at times. Bowaters had no less a spokesman arguing for its permit than U. S. Senator Strom Thurmond, former governor of the state. There was no expressed opposition.

DREDGING a channel with Armco Pipe

COAL handled hydraulically with Armco Pipe



PHOSPHATE mining operations with Armco Pipe



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CHECK THESE FEATURES: Smooth interior, free from laps or other obstructions, provides high flow capacity; hydrostatic testing assures ample strength for high pumping pressures; wide range of diameters and wall thicknesses avoids compromise with exact job requirements; pipe ends can be supplied machine reduced or expanded, with flanges or standard coupling, or for welding.

For more than 35 years, Armco has been producing pipe for hydraulic material handling. The Armco Special Analysis Steel Pipe of today is the culmination of these years of research and practical field experience.

Armco Special Analysis Pipe has ample strength and ductility, combined with high abrasion resistance to provide long service life and hold down costs.

For more details in terms of your own requirements, write us. Also ask about Armco Steel Pipe for water supply lines and similar needs. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3636 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Special Analysis Steel Pipe

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WASHINGTON OBSERVER

The multi-billion highway program is almost a shoo-in, now. Hearings on tax provisions held by the Senate Finance Committee last week indicate how far the various groups are in agreement. There was almost no opposition to the tax increases, something quite unusual in an election year.

Sec. Humphrey warned against spending the money before it's collected. This, he points out, could occur under both the House and Senate versions. Humphrey also noted that user taxes now in effect are part of general revenues, and he objected to earmarking sales taxes on rubber, buses, and trucks for highways only.

The big issue left is how to allocate money to the states. A bloc of western states is working for the traditional formula, which they'll fight for on the Senate floor and in conference committee. The House version would parcel out the funds for the interstate system on the basis of the needs of the system in each state.

Allocations of funds under the new bill could be out next month. Compromises that will have to be made in ironing out differences between House and Senate versions aren't expected to delay the measure long. The tax increases take hold July 1—and government officials will have the allocations out before then, if it's at all possible.

•

Senate approval of a Niagara power bill still leaves final action in doubt. Its version would permit the New York State Power Authority to develop the vast untapped energy available at the Falls.

Public power advocates won the battle by a 48-39 vote when they approved Sen. Lehman's bill which also includes provision for giving preference to municipally-owned and cooperative power companies.

House sentiment still favors letting private companies build the Niagara plants; that's the way the vote went two years ago. The House Public Works Committee is expected to move fast to get a bill out again, but it's doubtful whether Chairman Charles A. Buckley (D., N. Y.) can get legislation to the House for debate and a vote before adjournment.

•

Administration officials worry about general business, but not construction. That's the consensus from a weekend session of government officials and industry and business representatives who make up the Business Advisory Council of the Commerce Department.

They note the falloff in housing is made up by other construction—and they are particularly heartened, for the long term, by the increases in spending for plant and equipment that business is planning (see page 102).

The ceiling on construction is materials, not money, government officials were told. There's plenty of business for contractors; delays come from steel and cement and the like, not from customers' lack of funds.

Businessmen could cite no single instance of failure to build for lack of money, which bolsters the long-term stability of both construction and the economy in general.

For the short term, officials are confident the Federal Reserve Board will ease up quickly if it sees that a real money pinch is coming. Actually, the Administration—Cabinet members and the Council of Economic Advisors—is putting indirect pressure on the Federal Reserve to revoke its latest increase in interest rates. The board sees a threat of inflation it wants to head off but the Administration fears a softening that (a) could turn into a real business slide and (b) a worsening situation on business activity and employment to take to the polls in November.

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Now Link-Belt Speeder gives you "small rig" speed in a

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Here's the K-608 with true power hydraulic controls. It's faster . . . more agile and mobile . . . easier to handle than many machines half its size!

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And, the K-608 is precision-made of quality components with plenty of stamina to stand up under continuous use of great usable horsepower. It's designed to cut downtime, too. Clutches are hydraulic actuated, automatically compensate for heat and normal lining wear.

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- FREE-SPOOLING DRUMS mounted in anti-friction bearings allow greater free rolling action with minimized power loss . . . positive alignment makes smoother braking, clutching.

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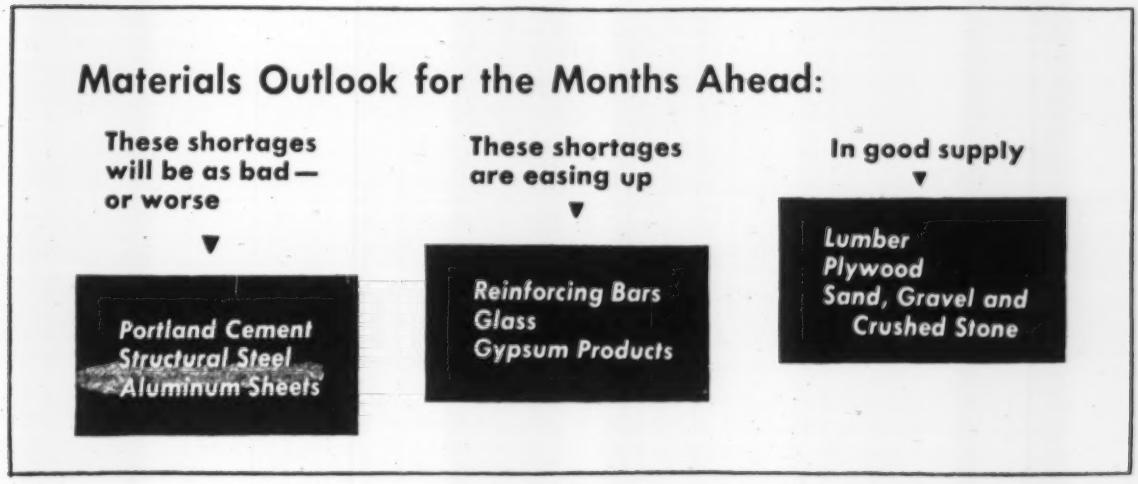

A Scramble Is On for Items in Short Supply

As the construction industry enters the peak period of the biggest boom in its history, contractors can expect to cope with serious shortages of structural steel, plate glass, portland cement and aluminum building sheets.

An ENR nation-wide survey this week pinpointed these trouble spots it also indicated milder shortages of reinforcing steel, gypsum sheathing and gypsum lath.

The unseasonably cold and rainy spring weather in many sections of the nation held down construction activity and took some of the pressure off materials supplies. Now, with warmer weather and blue skies, contractors are beginning to push their construction schedules and the scramble is on for all major construction materials. Here is the supply outlook for major materials during the next three months:

• Cement

Although producers were able to fill their cement silos during the first few months of the year when weather dampened construction activity, the reserves won't match the heavy demand expected in the next three months.

Of 19 cities checked by ENR, 10 expected to encounter serious shortage during June, July and August. They are: Baltimore, Birmingham, Boston, Cincinnati, Cleveland, Denver, Kansas City, Los Angeles, Minneapolis, and New York. In Minneapolis, for example, cement supply is reported to be getting tighter each day.

In addition to the 10 cities definitely slated for the "shortage list", Detroit, Chicago and New Orleans face a possible tightening and spot shortages.

Not only will cement be hard to get, but it will cost substantially more in some cities. Prices are expected to move higher July 1 in at least four areas. Philadelphia's cement prices may jump 25 cents to 40 cents a barrel. Kansas City sources expect prices there to climb 20 cents a barrel. Increases also are expected in Detroit and Boston, but the price rise in those two cities may be held to a few cents a barrel.

A big factor in the cement price situation is the recent 18-cent an hour pay hike granted to its workers by Penn-Dixie Cement Co. If this becomes an industry pattern—and some think it will—a substantial mill price increase can be expected. (The pay raise was more than double the one granted last year.)

• Structural Steel

Construction is starting to get a bigger piece of the steel pie—but the industry's appetite is growing, too. The net result is that structural steel is in short supply now and will continue on the scarcity list throughout the heavy demand period of June, July and August.

Mill shipments showed tremendous increases in the first quarter. Heavy structural shapes ran 27% ahead of the mill shipments in the first quarter of 1955. Steel sheetpiling was up 31%, plate shipments 39%, and reinforcing bars 41%.

Fabricators, well equipped to handle the increased flow of steel from the mills (ENR March 15, p. 22), shipped a record monthly tonnage of fabricated structurals during March.

But, there's a catch to this. New orders for fabricated structurals still are piling up even faster than the record volume of shipments. This means that new orders will have to wait as long—or longer—for delivery as those placed in the past 12 months.

Although warehouses will have more structurals on hand than they did last year, heavy demand will quickly drain off the added steel, keeping warehouse inventories low and supplies tight.

• Reinforcing Bars

The outlook is a little brighter for reinforcing steel. Bars should be in better supply, relative to demand, even though orders are heavy. Bar shipments from the mills are running 41% ahead of last year. This flood of material will help relieve shortages and will reduce the extended delivery time on new orders (up to three months or more) in some cities that have been hard hit.

Shortages of reinforcing bars are most serious in five cities: Birmingham, Chicago, Denver, Detroit and Philadelphia. Although Philadelphia

. . . Scramble is on for materials

expects bar shipments to continue on allocation, warehousers expect to meet the heavy demand of the next few months, with a good chance that the shortage will end there.

Supply of reinforcing bar is improving in Atlanta and Los Angeles—which this month dropped off the shortages list.

The lag in the automobile industry may prove a boon to construction in the months ahead. The automotive cutbacks will enable producers to channel more "raw steel" into construction items—with reinforcing bars expected to gain the most.

• Plate Glass

Shortages of plate glass will ease during the next three months, and window glass should be adequate to plentiful in most areas.

Improvement in plate glass supply is important because this shortage has ranked with structural steel as one of the big materials bottlenecks.

As in the case of steel, the cutback in automobile production aids construction. The current sharp decline in the automotive line means that construction will get a bigger share of the plate glass output in the next few months. Beyond that, the automobile industry holds the key. If production of the new models is heavy this fall, the construction industry will suffer again.

Pittsburgh Plate Glass expects some help from its new plant at Cumberland, Md. Production there has been delayed by the Westinghouse strike, but now it is expected to be producing rough plate by mid-July.

Libbey-Owens-Ford, another major producer reports that its plate glass supplies are keeping up with demand, partly because of plant expansions at East Toledo and Ottawa.

Window glass is in much better supply than plate glass. Production has remained high and because of some decline in demand, dealers have had an opportunity to build inventories in anticipation of the fall, when sales reach their peak.

• Aluminum

Growing in importance as a construction material, aluminum is enjoying record demand and the current tight supply is expected to continue during the next three months.

Aluminum building sheets are on the shortage list in Boston, Denver, Kansas City, New Orleans and San Francisco. Although New York supplies are adequate now, demand is picking up so fast that delays may be encountered soon. Philadelphia already is feeling the pinch.

Two factors are working to increase availability of aluminum building sheets and other aluminum products used in construction. Added capacity is now coming on the line. And, reduced government stockpiling will release a larger tonnage for construction and other consuming industries. Alcoa, which has just completed an addition that will increase its capacity by 86,000 tons, cites both these factors in forecasting a "possible slight easing" of the current supply situation over the next three months.

Aluminum production is setting a fast clip, sparked by the construction industry which is aluminum's No. 1 customer—and takes more than 20% of all wrought aluminum tonnage shipped by the mills. Primary aluminum production set a record in the first four months of this year, 13% above year-ago figures. And, mill shipments of aluminum products raced along 18% ahead of last year on the basis of the first two months. For example, largest increases came in those products used for construction. Non-heat treatable sheet and plate was up 27%, soft alloy extruded shapes up 24%, and aluminum wire and cable shipments, up 23%.

The tip-off on aluminum prices will come from the steel settlement. If the steel wage hike is substantial, aluminum workers will get a comparable boost—and aluminum prices will jump.

• Gypsum

Although supplies of gypsum products currently are short in Atlanta, Baltimore, Birmingham and Cleveland—with deliveries taking from two weeks to three months—shortages generally are easing.

Poor weather and the slowdown in housing starts cut demand and slowed the shipment rate for gypsum wallboard, lath and sheathing.

Although demand is expected to rise in the next three months, a repetition of last year's acute shortage seems unlikely. New producing units will boost the supply this year, with even larger additions to capacity slated for next year.

National Gypsum has already spent $31 million as part of its $95-million expansion program that includes a quarry at Halifax, Nova Scotia; a 25% increase in capacity at the Baltimore and Halifax plants; completion of the Shoal, Ind., plant; and construction of plants at Burlington, N. J., and Westwego, La. The Burlington plant expansion, which will boost capacity there by 40%, will start operating in July.

Kaiser Gypsum's new plant at Pittsburg, Calif., is scheduled for completion at mid-year. To replace the Redwood City, Calif., plant that was completely destroyed by fire last year, Kaiser will build a new plant at Antioch, Calif. Capacity of the Pittsburg and Antioch plants will be 274,000,000 sq ft of gypsum board and 20,000 tons of plaster.

U. S. Gypsum has strengthened its supply situation. In March, '56, it opened its Stony Point, N. Y., plant and has increased its Norfolk gypsum board output and plaster output. The company also is boosting the capacity of its Lisbon Falls, Me., insulation board plant by 40% with first production set for the spring of 1957. Sheathing and lath output at its Plaster City, Calif., plant also is being increased.

Expansion of other producers also will help keep gypsum supply good. Pabco Products is adding new plants at Newark, Calif. and Florence, Colo., with production slated to start this year. Blue Diamond is doubling production at its Blue Diamond Calif., plant. Certain-Teed is spinning off its gypsum properties in the U. S. and Canada, forming the Bestwall Gypsum Co. Bestwall will develop Nova Scotia deposits and build three gypsum plants to serve the East Coast markets. Ruberoid is building gypsum wallboard, lath and plaster facilities.

• Lumber

Supply of softwood lumber—Douglas fir and southern pine—is easier this year than it was in 1955. But there are still supply problems in the offing. A freight car shortage could revive the problem of slow deliveries—and shortages—particularly if homebuilding begins to spurt.

At the present time, lumber is in good supply and deliveries are normal in all but a few of the cities checked in the ENR survey. However, shortages of Douglas fir have turned up in Boston, Chicago, Kansas City, and Seattle, while southern pine is short in Boston, Kansas City, and New Orleans.

Prices have leveled off in the last month after pressing upward during the first quarter. Last week, fir prices dipped in three cities, indicating some softening of demand.

• Plywood

Boston, Chicago, Kansas City and St. Louis currently are experiencing a shortage of Douglas fir plywood. But they are the exceptions. As a general

rule, there will be fewer shortages this year than in 1955.

Order backlogs are down substantially from last year's peak. Mills in the Pacific Northwest are trimming production schedules because of the downturn in orders.

Because of the slackening in demand, some mills have reduced Douglas fir plywood prices twice within the past six weeks. However, no further price cuts are expected, and mill prices are expected to rise when a large volume of work delayed by bad weather creates a heavy demand. This demand will come at a time when many plywood plants shut down for vacations and when railroad cars are diverted to haul crops from storage.

Despite recent cuts by some mills, plywood production is running 8.6% ahead of last year, while new orders have dipped 4% below 1955. Order backlogs for Douglas fir plywood (on a ⅜th in. basis) total about 300,000,000 sq ft, slightly more than half of the 1955 peak of 585,000,000 sq ft of unfilled orders—posted in Feb. '55.

• Aggregates

Sand, gravel and crushed stone, which are in good supply generally, are expected to stay that way in all but a few major cities. Boston reports a current shortage of sand and gravel and supplies are tight in Cleveland. Deliveries are slow in Denver, but supplies are rated adequate. Chicago expects the supply of aggregates to just about meet peak demand. But there's a chance of spotty shortages of crushed stone.

Supply and Delivery Picture for Key Materials in 21 Cities in May

Key: Supplies— X = shortage **A = Adequate P = Plentiful**
Deliveries— N = Normal SI = Slower than normal I = Immediate Delivery time shown in days

Material	Atlanta		Baltimore		Birmingham		Boston		Chicago		Cincinnati		Cleveland		Dallas		Denver		Detroit		Kansas City	
	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv
Cement, Portland	A	2-3	X	N	P	1	P	1-6	A	1	A	1	A	1-2	A	1	A	N	A	N	A	7
Structural shapes	X	120	A	30-90	X	90	X	30-60	X	365	X	10-21	X	9	X	360	X	90	X	90	A	2
Reinforcing bars	X	90	A	20-30	X	90	A	1-2	X	14-21	A	21-30	A	2-3	A	7 [2]	X	90	X	90-120	P	2
Sheetpiling steel	X	180	...	...	...	...	...	...	X	180	A	Indef	...	...	X	360	X	42-56	X	455	...	...
Copper water tubing	P	1 [1]	A	1	A	1	A	2-7	A	1-30	A	2-10	A	2-3	A	30 [2]	X	45	A	7	P	1
Centrifugal cast iron pipe	A	14	A	10-20	...	...	X	60-70	X	30-45	...	...	...	...	P	7 [2]	...	...	...	...	X	90-120
Stainless steel sheets, flat	...	...	A	3-5	A	90	P	7	A	Indef	P	1-3	A	3-7	A	10	X	90-120	A	N	X	60-90
Aluminum sheets, flat	...	...	A	3-4	A	30-60	X	126	A	Indef	P	3-7	A	7	A	10	X	90-120	X	60 +	X	60-90
Douglas fir	...	...	A	2-3	A	21-28	X	14-42	X	21-28	A	20-30	A	...	...	...	...	...	A	N	X	21-42
Southern pine	A	2-14	A	2-3	A	14	X	14-35	A	14-21	A	10-12	A	...	P	14	X	30-40	A	N	X	21-42
Plywood, Douglas fir	A	1	A	7-10	A	21-28	X	7-14	X	21	A	20-30	P	30	P	30	...	...	A	N	X	21-42
Vitrified clay sewer pipe	X	120-480	A	7-14	X	60	X	...	X	7-14	A	3-4	A	7	P	7 [2]	A	150	A	N	P	1
Concrete sewer pipe	A	1	A	1-2	A	90	P	2-7	A	1	A	5-10	A	2-3	P	7 [2]	P	1	A	N	P	2
Structural clay tile	X	SI	A	5-7	A	30	X	21-35	A	2	P	7	A	2-3	P	10	...	...	A	N	A	3-4
Brick	A	1	P	1-2	A	30	P	2	A	1-2	P	7	A	2-3	P	10	A	N	A	N	A	3-4
Mineral wool insulation	A	1	A	3	P	14	X	14-21	A	14-21	A	20-30	P	2	P	14 [2]	A	30	A	4-5	A	14-30
Glass fiber insulation	A	1	A	3	A	21	A	7-14	A	14-21	A	20-30	A	8	P	14 [2]	A	1	A	N	A	14-30
Gypsum lath	X	14-21	X	30-60	X	30	A	2-3	A	7-10	X	5-10	X	60-90	P	14 [2]	A	30	A	N	P	14-30
Gypsum sheathing	X	14-21	X	30-60	X	30	A	2-3	A	To 21	A	40-60	X	60-90	P	14 [2]	A	30	A	[7]	P	14-30
Window glass	X	28-42	A	2-4	X	30	A	7-14	X	28-42	X	Indef	A	1-60	P	7-14	X	Indef	X	60-90	X	Indef

Material	Los Angeles		Minneapolis		New Orleans		New York		Philadelphia		St. Louis		San Francisco		Seattle		Montreal		Toronto	
	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Deliv	Sup	Seliv	Sup	Deliv	Sup	Deliv
Cement, Portland	A	N	P	N	...	SI	P	N	A	N	A	1-2	P	1	P	2	A	7	P	1
Structural shapes	P	N	X	3	...	...	X	SI	X	90	X	3-7	A	30	X	120	X	150	X	150-240
Reinforcing bars	A	N	A	14-20	A	N	A	14	X	90	X	3-7	A	7-14	A	45-60	X	105	X	To 70
Sheetpiling steel	X	[6]	X	...	A	N	A	14	A	1	...	...	A	30	...	...	A	40	X	120-150
Copper water tubing	P	N	X	14-28	A	N	X	SI	X	21	A	2-5	A	1	A	2	X	30	A	1-2
Centrifugal cast iron pipe	P	N	A	40-45	...	...	...	...	P	1	X	42 [2]	P	7-14	P	14	P	7	P	7-10
Stainless steel sheets, flat	P	N	A	SI	X	SI	A	N	A	10 [2]	A	1-2	A	14	A	14	X	40	X	To 180
Aluminum sheets, flat	P	N	A	N	X	SI	X	SI	A	10 [2]	A	1-3	X	45-60	A	90	X	45	X	SI
Douglas fir	P	N	A	21-28	X	SI	A	30	A	To 30	A	1-3	A	14	X	14-60	P	7	X	28-55
Southern pine	...	...	...	...	X	SI	A	30	A	To 30	A	1-3	...	...	...	...	P [11]	7	X	28-55
Plywood, Douglas fir	P	N	A	N	A	N	P	30	A	To 30	X	21 [2]	P	14-21	A	7-21	P	7	X	To 150
Vitrified clay sewer pipe	P	N	A	N	A	N	A	10-14	P	1	X	3-14	P	7	A	To 45	A	14	A	1-4
Concrete sewer pipe	P	N	X	N	A	N	P	7	P	1	X	3-14	P	7	P	1	A	7	A	3-7
Structural clay tile	...	...	P	N	X	SI	A	N	P	1	X	7-30	P	3	A	1	A	7	P	1-2
Brick	X	60	P	N	X	SI	P	N	P	1	A	1	P	3	P	1	A	40	A	7
Mineral wool insulation	P	N	A	14-21	A	N	A	N	...	...	A	1-3	P	7-14	P	2	P	7	A	1
Glass fiber insulation	P	N	A	14-21	...	...	A	N	...	...	A	2 [2]	P	7-14	P	2	P	7	A	1
Gypsum lath	P	N	A	N	A	N	P	N	...	...	A	1-3	P	7	P	2	P	7	A	1
Gypsum sheathing	P	N	A	14-21	A	N	P	N	...	...	A	1-3	P	7	P	2	P	7	A	1
Window glass	P	N	X	30-60	X	SI	A	30	X	SI	X	3-21	X	60	X	60-90	A	7	X	7-10

- [1] *Smaller sizes (1x6, 1x8, 2x4) adequate with deliveries in 2 to 6 days*
- [2] *Spruce*
- [3] *Interior plywood, exterior adequate with deliveries in 2 to 4 days*
- [4] *Sanded plywood short, regular adequate*
- [5] *24 and 36 in. size, smaller sizes adequate*
- [6] *No deliveries because of strike*
- [7] *Available only on allocation*
- [8] *Order books closed for 1956*
- [9] *No orders from new customers until December*
- [10] *Smaller sizes (1x6, 1x8) adequate, deliveries 15 to 30 days*
- [11] *Spruce quoted. Shortages in 1x8's, deliveries 30 days*

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Toll Rates Change

Higher for cars, lower for trucks on Penn. 'Pike

A general toll revision on the Pennsylvania Turnpike is scheduled to substantially increase rates for passenger cars while reducing them for trucks.

The rate revision—the first on the main system in some 15 years—is attributed by the Turnpike Commission to increased operating, maintenance and replacement costs. The new schedule is expected to boost profits by millions of dollars a year.

Beginning May 25 passenger car tolls will be increased 41% from the new Delaware River Bridge to Ohio—a distance of 360 miles. Tolls for the most commonly used 60,000-lb gross weight trailer-trucks will be reduced 2%. This means that the cost of a cross-state run for passenger cars will go from $3.90 to $5.50, while the former $23.80 toll for a 60,000-lb truck will be lowered to $18.95.

In general, the effect of the new fare schedule will be to increase the tolls for travel through mountainous sections of the state and reduce them in areas of easy travel.

The revision, which follows eight months of engineering study, comes at a time when the Turnpike Commission is more than six years ahead on retirement of its serial bonds and has some $16 million in its reserves.

The turnpike system reported a net profit of $8.4 million for the fiscal year ending May 31, 1955. But toll-road officials have been concerned over a slackening use of the system by trucks. In recent years, trucks have been paying about 60% of the total tolls, although they represent only 20% of the vehicles using the road.

Record Award

$92-million MC&S bid on Priest Rapids accepted

Merritt-Chapman & Scott Corp. of New York was notified last week that its low bid of $91.9 million for construction of Priest Rapids Dam will be accepted, subject to the sale of revenue bonds to finance the project. The bond sale, by the Grant County PUD of Euphrata, Wash., is scheduled for June 15 completion.

The contract will be the largest single construction contract ever awarded and the largest ever entered into by a single contractor (ENR Mar. 22, p. 21 and May 10, p. 82).

An underwriter group headed by John Nuveen & Co. of Chicago is handling the bond transaction, a $162-million issue. The interest rate has not yet been determined and some concern has been expressed that it may be higher than expected because of an unusually tight money market. However, no serious hitches are expected.

Included in the $91.9-million contract will be construction of 8,400 ft Priest Rapids Dam, and a 664,000-kva power plant complete with turbines and generators, and also exploratory work for Wanapum Dam, 15 mi upstream on the Columbia River. Work at Priest Rapids must commence by July 1 under terms of the PUD's license from the FPC.

Grant County PUD has signed conditional power contracts with 12 other public and private utilities in Washington and Oregon. These contracts have been placed in escrow until the Nuveen syndicate has submitted its bid for the bond issue.

Water Softening

City's "noble experiment" suffers another setback

Toledo, Ohio, has been forced to halt, at least temporarily, softening of its water due to difficulties in controlling taste and odor. Treatment by the lime-soda ash process lowers pH of the water to the point where activated carbon treatment for taste and odor control is not effective.

City Water Commissioner Sol J. Wittenberg advocates retaining an outside consultant to research the problem, but the Water Department's chief engineer and purification superintendent, George Van Dorp and R. R. Henderson, suggest that the city's $772,000 investment in softening plant might better be written off as a "noble experiment that failed." They add that use of detergents has "devalued" soft water and should prompt a reconsideration of the economic aspects of softening Toledo's water. The issue is now before the city administration.

Toledo's water, drawn from Lake Erie, averages 180 ppm of hardness. The taste and odor problems stem from industrial wastes discharged into streams that feed Lake Erie and from periods of high algae concentrations.

Extensive studies begun in 1947 by the late Charles P. Hoover of Columbus, Ohio, and continued by the Toledo firm of Finkbeiner, Pettis & Strout, indicated that softened water would save consumers $750,000 a year in soap expenditures in addition to the other usual benefits. Consequently, softening equipment was added to the city's Collins Park treatment plant by October 1954.

Second Ohio 'Pike

Construction hinges upon favorable financing terms

Gov. Frank J. Lausche has ordered the Ohio Turnpike Commission to build Turnpike no. 2 between Cincinnati and Conneaut if it can be financed on reasonable terms.

The order settled a difference of opinion between Highway Director S. O. Linzell, who favors the 301-mi turnpike, and Commission Chairman James W. Shocknessy, who has urged a delay in construction plans until after the pending new federal highway program has been evaluated (ENR May 10, p. 19). Ohio, under terms of the federal highway bill passed by the House, would get $411.4 million in the first four years of the 13-year program.

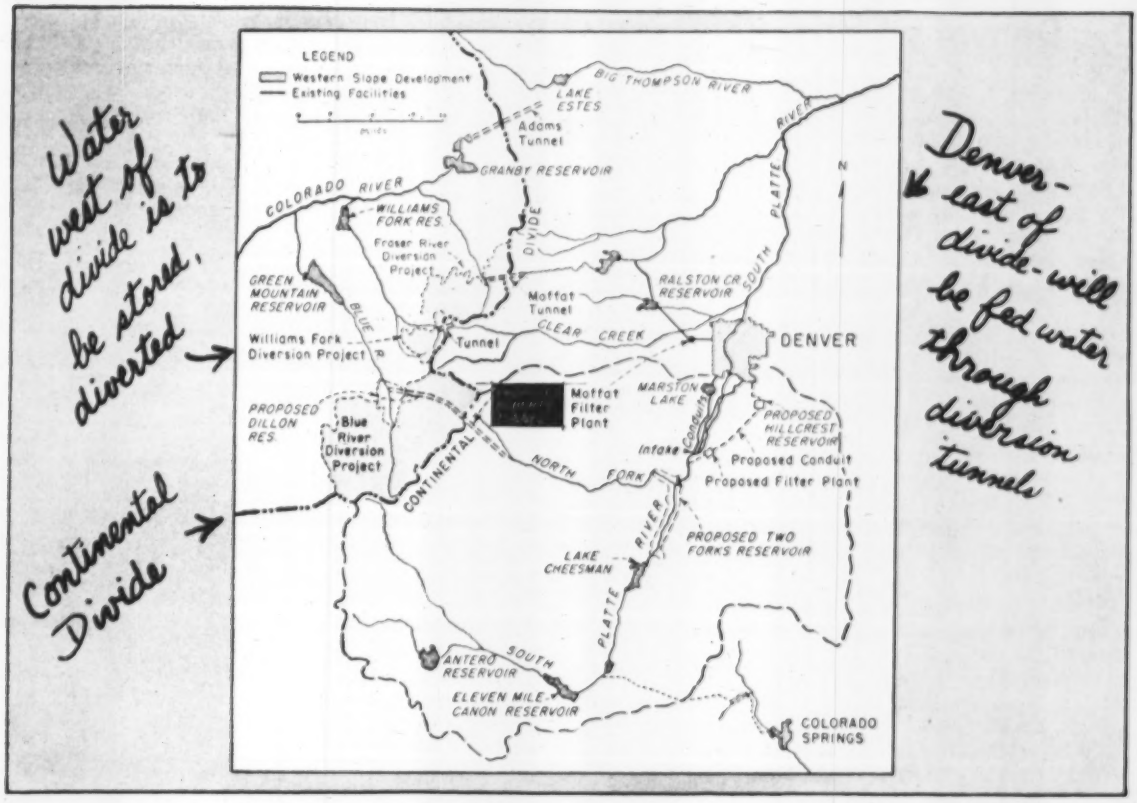
Shocknessy already has asked investment firms to study detailed engineering and traffic study reports and to submit two financing proposals. One proposal would be for construction of the entire route as a turnpike. The other would be for building it as a "broken" road, with a 40-mi free section between U. S. 23 near Delaware and U. S. 40 west of Springfield.

The project already has been found entirely feasible in its civil engineering and construction aspects. Cost estimates, submitted by J. E. Greiner Co., Baltimore, total $385.8 million for the complete tollroad and $346 million for the "broken" road (ENR May 10, p. 27). Coverdale & Colpitts, New York, estimate revenues in the first year from the complete tollroad at $21.3 million and from the "broken" road at $17.5 million.

Shocknessy said the governor's instructions indicate that the state does not intend to build any part of the turnpike as a freeway, so the commission may be "under a mandate to provide the urgently needed facility in its entirety."

Governor Lausche said his decision was due to four factors:

- The Fallon Bill will not provide sufficient funds to underwrite the cost of the turnpike and insure improvements needed on other sections of the state highway system.
- Metropolitan areas can be expected to get as much as one-half of the federal aid funds for completion of expressways.
- All Fallon Bill funds for the first six years must be applied to building freeways.
- Some of the money becoming available under the federal program may be diverted to reimbursing states for adequate turnpikes started prior to Jan. 30, 1957.



23-mi mountain tunnel ready for bidding as . . .

Denver Launches $101-Million Water Project

Bids will be received June 29 on a 23-mi tunnel to deliver more west-slope Colorado River water to Denver, Colo.

Calling for bids on this key element of its plan, the Denver Water Board aims to place under contract by the end of this year one-half of a $101 million construction program intended to more than double the city's water supply by 1970.

Two firms of Denver consulting engineers have been at work on plans and specifications for major units on the diversion of water from the western slope of Colorado's mountains to the Denver water system. The water board's own engineering staff is working on plans for expansion of existing facilities.

Tipton and Kalmbach, Inc. of Denver have produced plans and specifications for the 23-mi long tunnel under the Continental Divide. It will bring water from the Blue River into the Denver system (see map).

• **Vital tunnel**—This tunnel has been named the Roberts Tunnel in honor of a water board attorney, Harold D. Roberts. He is credited with a major role in obtaining an agreement with western slope water interests and the federal government that gives Denver rights to the Blue River—a tributary of the Colorado River.

In an out-of-court settlement last year it was determined that 788 cfs of decreed water will be diverted from the Blue River for Denver. In return, Denver will replace power to the U.S. Bureau of Reclamation. Two power plants for this purpose are planned at Williams Fork Reservoir and at Grant at the east end of the Roberts Tunnel.

Earl Mosley, engineer-manager of the Denver Water Board says:

"Time is of the essence on the tunnel work. . . . It'll take five and a half years to drive that tunnel and by then we'll need the water from it."

Preliminary reports indicate that there are no faults in the geological structures in the tunnel area which passes through a mineralized zone—lead and zinc—in a well established mining district.

A dam and reservoir will be constructed at the tunnel's western terminus as part of the Blue River Project, which at this stage has an overall price tag of $50 million. The tunnel is due for completion in 1962. The first water into the reservoir is expected during the 1961 runoff season.

The Blue River project will add an average of 147,500 acre-ft annually (131 mgd) to Denver's water supply, now totalling 136,400 acre-ft. Denver receives no water from Blue River sources now.

• **Two other tunnels**—Tipton and Kalmbach are at work on specifications and plans for a $3.5 million tunnel to carry water from the Williams Fork River watershed. It will add about 12,000 acre-ft from the 1959 runoff and will eventually produce about 40,000 acre-ft a year. This system currently produces 7,500 acre-ft of water by exchange for Denver.

Alfred J. Ryan, Denver consulting engineer, has drawn plans for lining the east half of the pioneer bore of Moffat Tunnel to increase its carrying capacity to the full 1,280 cfs volume decreed for that system. Contracts will be awarded soon.

• **Big project readily financed**—Denver voters approved last fall a $75 million bond issue for the work. This issue of general obligation bonds will be supplemented by approximately $26 million of operating revenues during the 15-year construction program.

The whole program, and the means

. . . Denver's $101-million water project

of financing it, was worked out by the Denver Water Board staff with a review by the Chicago consulting firm of Alvord, Burdick & Howson. The report that came out of their two-year study helped materially in gaining voters' approval of the $75 million issue.

George R. Morrison, president of the Denver Water Board, has said: "In the history of the Denver municipal water system, no taxes have ever been levied to sustain the operation of the waterworks. We have carefully studied our present plans so that no additional tax burden will be placed on the taxpayers of Denver. In addition, present water rates are at a level to carry out the entire 15-year program if current construction costs and inflation trends do not materially change."

• **Parts of the project**—Here is a summary of the program:

1. Blue River Project, including storage, 23-mi long tunnel and power plant, $50,000,000.

2. Improvements to Fraser and William Forks Projects, including second barrel to Vasquez Creek Siphon, lining east half of Moffat Water Tunnel, a new tunnel under Jones Pass to Clear Creek for Williams Fork water and extension of Williams Fork collection system, $14,095,000.

3. Additions to raw water storage capacity through raising dams of Eleven Mile Canon and Williams Fork Reservoirs, thereby increasing capacity of each by 30,000 acre-ft, $1,266,000.

4. Enlarged raw water facilities to include a new South Platte River intake structure, extension of 90-in. conduit to this intake and new 96-in. conduit to the proposed Roxborough Filter Plant, $3,815,000.

5. Filter plant construction and additions including the proposed Roxborough Filter Plant of 200 mgd capacity and enlarging the Moffat Filter Plant from 80 to 160 mgd, $10,765,000.

6. New clear water conduits, $9,368,000.

7. Clear water reservoirs including new operating reservoirs at Hillcrest, southeast of Denver, to have a combined capacity of 40 mg and replacement of old No. 2 reservoir which is located at Capitol Hill in Denver, $2,791,000.

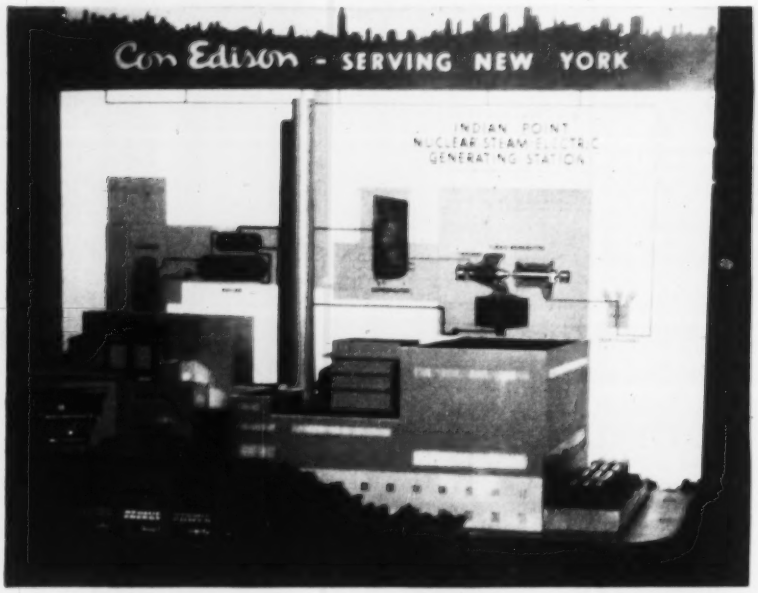
8. Miscellaneous projects including additions to system pumping plants, extensions of mains throughout city and various unallocated projects, $8,226,000.

• **Power for exchange**—Aside from its water supply projects, the Denver Water Board will build a 3,000-kw hydroelectric plant, costing $680,000, near a new dam to be built at the Williams Fork Reservoir and a 6,000-kw hydro plant at the outlet of the Roberts Tunnel.

The planned 183-ft high concrete arch dam at Williams Fork Reservoir will cost about $2.2 million. Construction is expected to get under way in July.

Power from the hydroelectric plants will be used to repay power to the federal government under the agreement signed last year between the city and the Bureau of Reclamation.

This agreement specifies that the federal government may fill its Green Mountain Reservoir with Blue River water, to full capacity of 154,645 acre-ft once a year. Denver, in return, is obligated to provide the government with power equal to that which the bureau would have produced without Blue River diversion by the city.

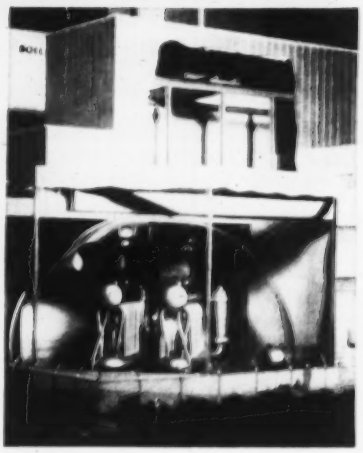


Atom Power Plant

The convention of the New York State Society of Professional Engineers in New York last week was shown a model of the nuclear power plant, which the Consolidated Edison Company will build north of that city. The model was one of about 40 exhibits arranged by different companies to be viewed by those who attended the convention sessions.

The power plant, which is being designed by the Babcock & Wilcox Co., will contain a reactor of the pressurized water converter type, utilizing U-235 and thorium as fuel. Water circulated through the fuel elements at 1500 psi will be pumped through boiler tubes to generate steam in the surrounding shell. This steam will then go to an oil-fired superheater where its temperature will be raised to 1,000 F. It will then operate a conventional turbine of 236,000 kw capacity.

In the picture at the top the reactor and boiler setup is at the left, where the building is cut away. The superheater building is next to it, and at the right is the turbine-generator building. The enlarged view below shows the boiler enclosed in a plexiglass dome to simulate the shell. The reactor is directly behind it.



The plant, to cost $55 million, is scheduled for completion Oct. 1, 1960.

An Engineering Monument, John A. Roebling's suspension bridge at Wheeling, W. Va., has been in use for 100 years. Ceremonies on May 20 paid tribute to the designer and builder, whose engineering masterpiece requires . . .

At Century Mark, Only Repairs

The first bridge to span the Ohio River, the first to exceed 1,000 ft in span length, and the oldest existing suspension bridge in the United States are among the notable characterizations that can be applied to a famous century-old structure at Wheeling, West Virginia.

For these reasons, and because it has uninterruptedly carried traffic since before the Civil War and is sound for future service, the bridge was the scene of a celebration May 20 to mark it as a worthy national monument and a memorial to its designer and builder, John A. Roebling.

In charge were members of the local chapters of the state societies of professional engineers in West Virginia and Ohio who, with other interested engineers, had conceived the plan last year when it was learned that an overhaul of the bridge structure was to be undertaken to repair some of the ravages of time.

That the Wheeling suspension bridge deserves to be marked for posterity was emphasized at the celebration by D. B. Steinman. He spoke as an admirer and authority on John A. Roebling, the designer, who, some years later, climaxed his remarkable career with the design of the Brooklyn Bridge at New York.

Dr. Steinman recalled the fact that the 1,010 ft span of the bridge—by far the longest in the world at the time—was the result of the imagination, daring, and salesmanship of Charles Ellet, Jr. He won out in a competition with Roebling, who proposed a 600 ft main span and two side spans.

• Windstorm destroyed Ellet bridge—Ellet thus built the first bridge. But the Ellet bridge was destroyed in a windstorm on May 17, 1854, five years after it was completed, and Roebling was engaged to replace it on the same towers and anchorages. It is the Roebling bridge that has completed a century of service.

As Dr. Steinman pointed out, the original span was light and narrow for its length, carrying only a 17 ft roadway and a 3½ ft sidewalk, but "most important of all the span had no stiffening truss." The failure, in which the span lunged like a ship in a storm, rising to nearly the height of the tower, twisting and turning over, was described by Dr. Steinman as "a remarkable anticipatory parallel to the 1940 Tacoma Narrows bridge catastrophe."

• Testimony to Roebling's genius—The Roebling replacement bridge was a quite different structure. "With intuitive genius, a century ahead of his time," said Dr. Steinman, "he realized the need of bracing and stiffening suspension bridges against cumulative undulations that may be started by the action of wind."

Roebling had used ample stiffening and inclined stays in his first bridge, built across the Monongahela at Pittsburgh in 1844, and he had used them again in 1850 in his Niagara bridge, the first suspension structure to carry railroad trains. In this bridge he had also added under-floor stays to resist wind uplift.

Roebling's design for the Wheeling bridge has proved how well he used his knowledge of stiffening, for despite its lightness and narrowness it has withstood a century of traffic and weather.

• New deck to be installed—The repairs soon to be undertaken imply a confidence in many more years of service. According to Burl A. Sawyers, State Road Commissioner of West Virginia, and George W. McAlpin, assistant engineer, the bridge will be stripped down to the towers, cables and suspender ropes and completely overhauled from there.

The repair work will be performed by Ferguson & Edmondson, Pittsburgh, Pa., and, according to R. A. Wetzig, vice president, an entirely new deck will be installed and some of the wooden stiffening trusses will be replaced.

The new roadway will be 20 ft wide instead of the present 16 ft 3 in., while the sidewalks will be reduced from 6 ft to 4 ft 2½ in. (It is to be noted that Roebling had increased the 20 ft 6 in. width of deck used by Ellet to 28 ft 3 in. as part of his stiffening measures.)

Both the new roadway and sidewalks will be constructed of open steel grating. The reconstruction work is scheduled to be completed by the end of the year.

It will cost about half a million dollars, in striking contrast to the cost of Roebling's original superstructure which is said to have been $42,000.

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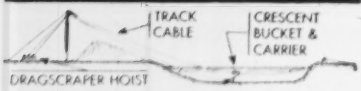

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AIA's annual convention sets a . . .

High Mission for Architects

The nation's architects were challenged last week to some serious soul searching on what constitutes the good life, and what architects can do about it.

At the 88th annual convention of the American Institute of Architects held in Los Angeles last week they were emphatically told that the good life is not just material comfort, and that the architect has a special responsibility to provide something more.

In his keynote speech on "Architecture and the Good Life," John E. Burchard, Dean of MIT's School of Humanities and Social Studies, put it like this:

"I cannot consent to identify the good life with air conditioning, or automatic refrigeration, or fancy kitchens . . . or with the television tube which stands ready in room after room to rob humanity of its hard won leisure. . . . The good life is not a matter of good gimmicks or of physical ease—it is a matter of things that uplift the spirit. . . . An egalitarian society in which every dwelling is pretty good and the communal dining hall comfortable, but in which nothing is really superb, is not a consummation to be wished or an achievement to be envied."

The dean proceeded to paint a gloomy picture of an America sorely in need of the superb, and not getting it from its architects. But he left his listeners with the thought that the challenge could be met.

• **Better community planning**—M. Justin Herman, HHFA regional administrator in San Francisco, called on the architect to take a more active part in a necessary "urban revolution . . . the deliberate, large-scale renewal of our cities to meet the needs of our time."

Herman pointed out that only a few hundred of the country's 17,000 cities have come up with the "workable programs" called for by the Housing Act of 1954.

Clarence S. Stein, FAIA, winner of this year's AIA gold medal, called architects to the task of replacing our "mad metropolitan monstrosities." He called for a concept of "community architecture" rather than "city planning." Beautiful cities, he said, "cannot be secured by the ordinary piecemeal process of city planning. A beautiful and livable urban environment cannot be boxed into cubby-holes bounded by fixed and dominating streets and lot lines. It must be created as an entity, embracing the site, the mass of buildings and their relation to each other and to the natural setting. . . . We must bring the peaceful . . . openness into every part of all our communities."

• **Awards**—Five first honor awards and 14 awards of merit were given out at the convention. First honors went to: Wurster, Bernardi & Emmons, San Francisco, for the Center for Advanced Study in Behavioral Sciences near Stanford University; to John Lyon Reid & Partners, San Francisco, for their Hillsdale High School in San Mateo, Calif.; to Hellmuth, Yamasaki & Leinweber, of St. Louis and Detroit, for the St. Louis Municipal Airport Terminal Building; to Skidmore, Owings & Merrill, New York, for the Manufacturers Trust Co., Fifth Ave. Branch in New York City, and to Philip C. Johnson, New York, for his design of the Hodgson residence in New Canaan, Conn.

Leon Chatelain, Jr., of Washington, D. C., was elected president and John Noble Richards, FAIA, Toledo, Ohio, was elected first vice-president.

ENR Wins Award

ENR this week was announced as a winner in the 18th Annual Business Paper Editorial Achievement Competition sponsored by Industrial Marketing Magazine. The award, announced at the annual convention of the National Industrial Advertisers Association in Chicago, was for ENR's May 26, 1955 issue, which spotlighted a special report on the important question of how to meet the country's critical classroom shortage.

Torqmatic makes the load go faster

CALL THE ROLL of leading shovel-type loaders and you'll find that almost every one of them – like Payloader, Trojan, Napco, Speedall and Scoopmobile– uses Allison TORQMATIC DRIVES in both gasoline- and Diesel-powered loaders.

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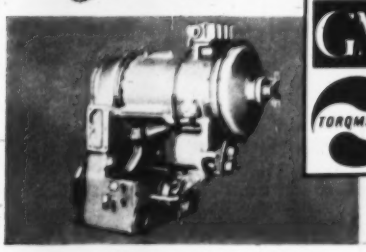
If you'd build or buy a better shovel-type loader, take a TORQMATIC tip from the leading manufacturers–specify Allison TORQMATIC DRIVES. For full details write to Allison Division of General Motors, Box 894E, Indianapolis 6, Indiana.



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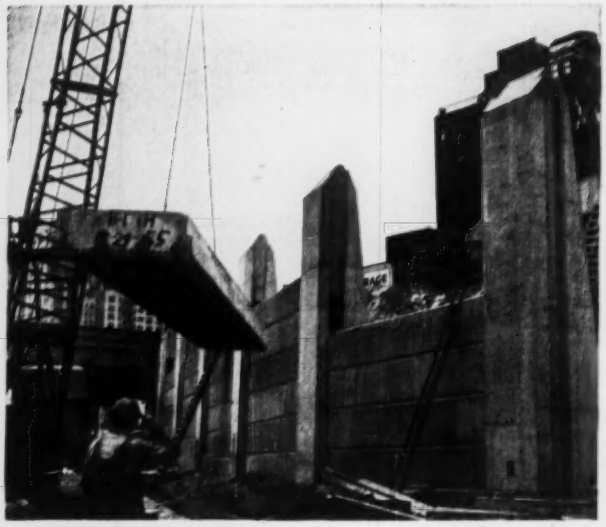


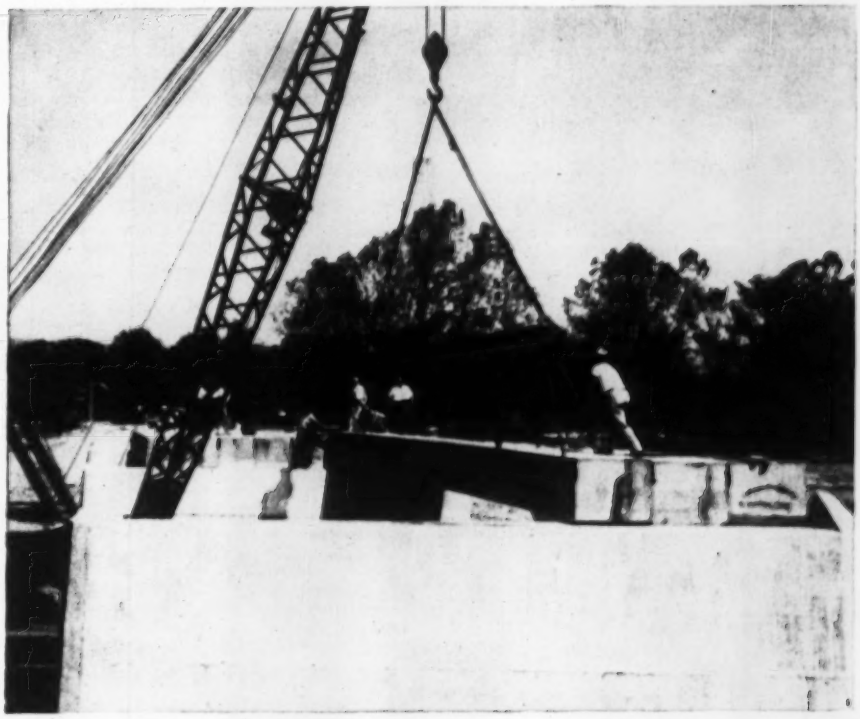
• FIRST OF ITS KIND

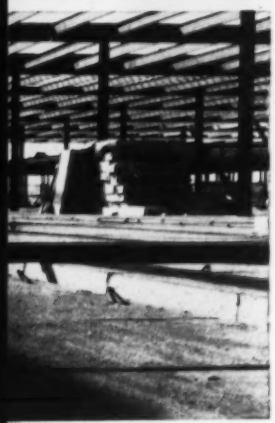
This Lincoln Tunnel Retaining Wall was designed and built by the Port of New York Authority. A maximum of 50 feet high, the wall consists of concrete piers poured in place with slots in the sides. Precast, prestressed panels are dropped into these slots to form the wall. This is the first use of this type of construction in the United States. The panels are 4 feet wide and either 12 inches or 18 inches thick. They are pretensioned to 175,000 psi, with thirty-two or forty-six ⅜" diameter American Special High Strength Stress-Relieved Strands. Panels were manufactured by Precrete, Inc., Astoria, Long Island.

• TWO MODERN IDEAS AND ONE OLD

American Welded Wire Fabric has been used for more than 30 years to reinforce all types of concrete construction. American High Strength Stress-Relieved Strand for prestressed concrete, a high-quality product developed expresly for this application, is now also being used extensively in all types of construction. A typical installation is this large shopping center at Roosevelt Field in New York, where precast welded wire fabric reinforced channel slabs combine with precast *prestressed* slabs to make a better building. The reinforced slabs, 16 feet long, use American Welded Wire Fabric, 3" x 8"–3 gage x 8 gage. The prestressed slabs, in lengths of 27', 31'-6", and 33'-6", are pretensioned with American High Strength Stress-Relieved Strand. This is a Webb & Knapp project, designed by Boehler and Bugnoni. Structural Engineers were Severud-Elstad-Krueger of New York City. Slabs were manufactured by Precrete, Inc., Astoria, Long Island.

PRESTRESSED CONCRETE





CUTS COST

The prestressed beams for this concrete bridge in Pennsylvania cost far less than conventional built-in-place members of equivalent strength. They were pretensioned with American High Strength Stress-Relieved Strand. Prestressed concrete often saves money because it can be precast on an assembly-line basis at a factory. In addition, prestressed members take less concrete and steel because the high strength steel is stronger and does "more work" per pound used. And prestressed members can be installed more quickly.

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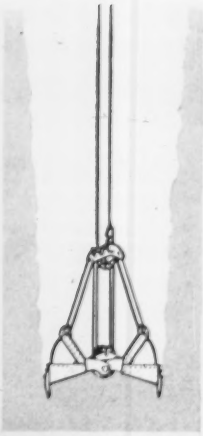

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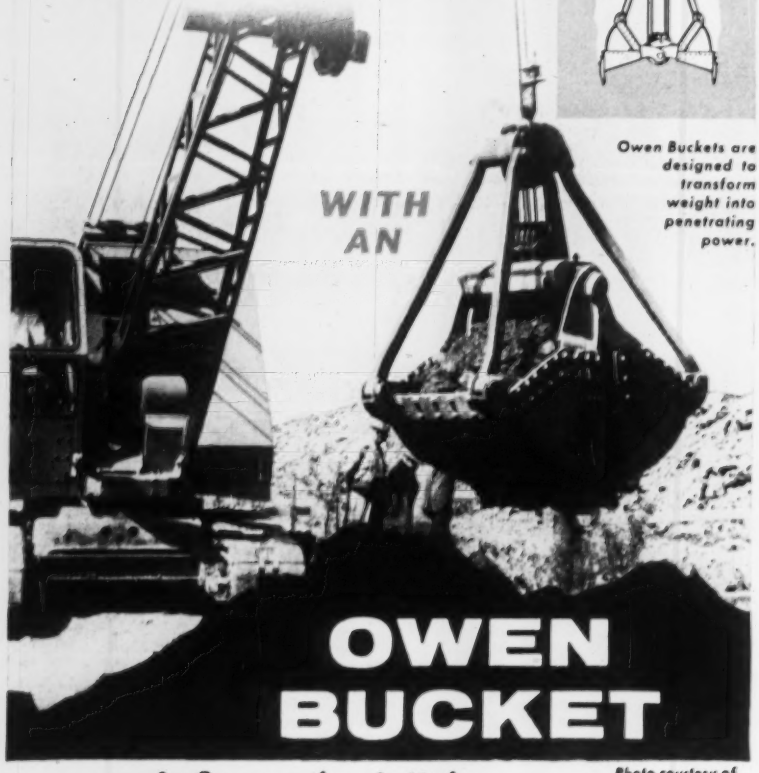

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R. J. Rhinehart

New NSPE Officers Named As Annual Convention Opens

Robert J. Rhinehart will be formally introduced as the new president of the National Society of Professional Engineers at its annual meeting in Atlantic City this week. He actually assumes presidency of the 36,000-member society on July 1, succeeding Allison C. Neff, vice president of Armco Drainage & Metal Products, Inc., Middletown, Ohio.

Mr. Rhinehart is an electrical engineer and a division superintendent for the Arkansas Power & Light Co., in charge of construction, operation and maintenance in 52 towns and cities.

NSPE has also announced six regional vice presidents and a treasurer. The vice presidents: Allen H. Kidder, Philadelphia; Warren Howe, Memphis; Clarke A. Dunn, Stillwater, Okla.; Lindley R. Durkee, Mercer Island, Wash.; Garvin H. Dyer, Independence, Mo., and H. G. Kennedy, Charleston, W. Va. Russell B. Allen of College Park, Md., has been reelected treasurer.

City Demands Control Of Norfolk Tunnel Approach

The City of Hampton, Va., has sued the State Highway Commission seeking city jurisdiction over the approach road in Hampton to the Hampton Roads Bridge-Tunnel.

City officials insist that through its charter, the city has specific jurisdiction over street and road construction, and that the Highway Commission's authority cannot supersede this.

It also complains that plans for the tunnel approach are causing damage to the city by impairing traffic movement, blocking large sections of present streets and damaging the future expansion of Hampton City.

Rotor discs for mammoth 11-stage compressor were balanced and stacked for alignment in one of Newport News' five huge machine shops. Large engineering and technical staffs with a vast plant make Newport News an ideal source for large equipment . . . *standard or special in design.*

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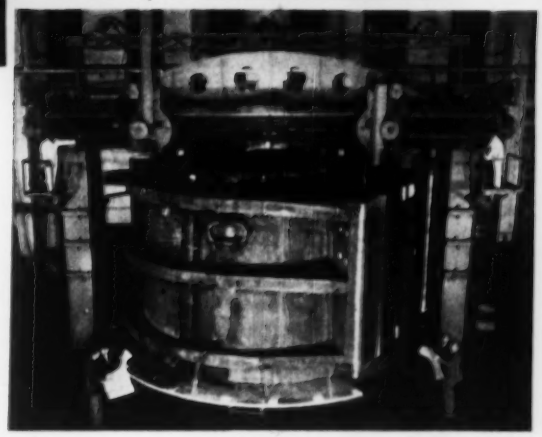

A 35-foot boring mill in Newport News' plant machining the 374,000-pound upstream housing for the giant axial flow compressor. The compressor is heart of an 8-foot supersonic wind tunnel at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics at Moffett Field, Calif.

Whenever you want large units built with careful attention to detail, give the job to Newport News.

This company recently built an eleven-stage axial flow compressor that shatters all previous records for wind force . . . using what is believed to be the world's largest rotating object.

The rotor, weighing more than 400 tons, comprises eleven huge discs. Each disc, machined from a 96,000-pound forging, was finished to a 50,000-pound wheel and balanced to within 26 ounces at the rim. In each rim, slots for blades were machined to within .005″ on special milling heads designed and produced in the Newport News plant.

Here at Newport News, you'll find more than large productive capacity. In machine shops, foundries and forging plants Newport News craftsmen complete your orders with specialized techniques backed by experience in fabricating thousands of products.

Newport News' craftsmen produce units that range from small components of spinning machines, to mammoth hydraulic turbines . . . from piping, pumps and valves, to vacuum tanks, digesters and bridge caissons.

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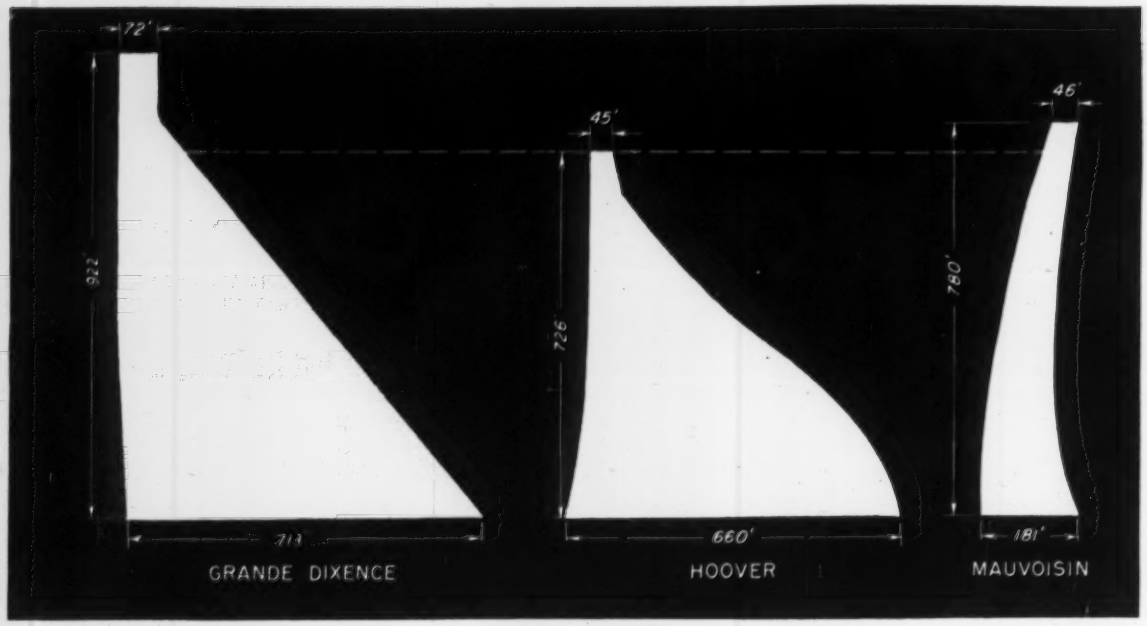


Higher than Hoover, Grande Dixence will set world record for gravity type, and Mauvoisin for arch type as . . .

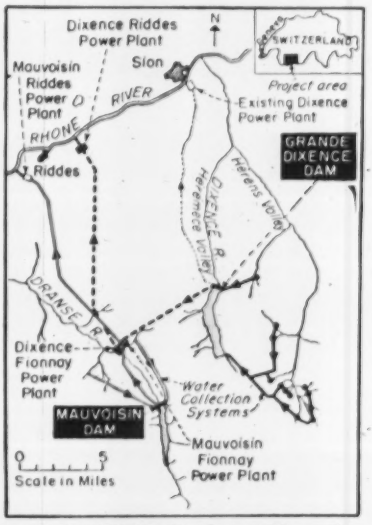
Swiss Take Over High Dam Leadership

Waldo G. Bowman
Editor, Engineering News-Record

It may take a little time to get accustomed to it, but the United States' supremacy in the tall dam field is rapidly fading away. For two decades Hoover Dam's 726 ft height has been unapproached, its fame as one of the greatest technical achievements of this generation a matter of pride to every American. The pride can remain, for Hoover is still the great pioneer, the great step forward in the high dam field as the Brooklyn Bridge was in the bridge field, but its height will soon cease to be a cause for amazement. When two dams, which Swiss engineers have under way, are completed, Hoover Dam will be just the third tallest dam in the world.

Grande Dixence Dam, the taller of the Swiss structures, will rise to the previously unthought of height of 922 ft. Of gravity type, like Hoover, Grande Dixence will also be the second largest concrete dam in the world, its concrete volume of 7,540,000 cu yd being exceeded only by Grand Coulee's 11,000,000 cu yd.

Mauvoisin, the other Swiss Dam, will be only 54 ft higher than Hoover, but for its type, an arch, its 780 ft height is even farther ahead of competition than is Grande Dixence. Tignes Dam in the French Alps (ENR Dec. 13, 1951, p. 30) holds the present concrete arch record at 592 ft, and there are very few in other parts of the world which exceed even 400 ft.



THE TWO DAMS are neighbors, but the area between is dominated by 10,000- to 13,000-ft Alpine peaks.

Grande Dixence and Mauvoisin dams are both in south Switzerland in the Valais section. Although one must travel about 50 miles to get from one dam to the other, the two structures are only eight miles apart, in adjacent valleys separated by 10,000- to 13,000-ft Alpine peaks. Grande Dixence is situated at the higher elevation, its base being at El 6835 ft, while the base of Mauvoisin dam is at El 5671.

Besides proximity, the two projects have other close relationships even though they are owned by different power companies. For one thing they trade water, Grande Dixence collecting some from high sources in the Mauvoisin watershed, which it can tap more economically, and paying it back with low elevation water from its own sources which, otherwise, would have to be lifted by pumps into Grande Dixence reservoir. The two companies have also located their power plants in close proximity—in the village of Fionnay at about El 4900, and near the town of Riddes in the Rhone River valley at El 1570.

It is as much in a comparison of

GRANDE DIXENCE DAM is being built in front of an existing dam. The structures at the upper right—aggregate silos, mixing plant and operations building for the cableways—are at elevation of top of the new dam. On the far side of the peak is the quarry for the concrete aggregates, reached by a tunnel.

these power facilities as of the dams themselves that the relative size of the two projects is clearly indicated. Grande Dixence is much the larger, its Fionnay plant having a capacity of 325,000 kw as compared with 137,500 kw in the Mauvoisin plant at the some location. Likewise, at Riddes, the Grande Dixence plant's total is 360,000 kw as compared with Mauvoisin's 225,000 kw.

Both plants at Riddes operate under 3,300-ft heads, but at Fionnay the Grande Dixence head is 2,880 ft and the Mauvoisin head is only 1,515 ft. It is notable, however, that this Mauvoisin Fionnay plant is equipped with vertical-axis Francis turbines of 62,800 hp, and the 1,515 ft head is the highest in the world for this type of machine. In all of the other three plants the generators are operated by horizontal-axis double Pelton wheels. The largest are at Grande Dixence, Riddes, where two 45,000-hp wheels are attached to each generator. Except for Mauvoisin's Riddes plant, all of these installations are located underground.

Cost information on these projects has never been made public, but taking one estimate that the overall cost of the Grande Dixence project will be in the neighborhood of $300 million, the installed cost per kilowatt would be about $440.

• Grande Dixence Dam features—These power plants, the tunnels and penstocks that feed them and the tunnels that collect the water to fill the reservoirs are all under way, but it is on the dams themselves that world-wide interest is focused. And Grande Dixence is worth considering first, since it is the larger one of the two and also the farthest advanced construction-wise.

Grande Dixence dam and its $3 million dollar construction plant were described in considerable detail in a previous article (ENR Dec. 3, 1953, p. 32), so only enough of its basic features will be repeated here to provide a background for outlining the progress that has occurred in the meantime. It may be recalled that it is called Grande Dixence because there is a "little" Dixence Dam already in existence just upstream, which will be flooded out by the larger project. This existing dam, incidentally, serves a 150,000-kw power plant in the town of Sion, 11 miles down the mountain, which operates under a gross head of 5,740 ft, the highest in the world. It will continue to be served by the new reservoir.

It required two years of major construction effort to establish the roads, tunnels and living quarters, and to assemble the site preparation equipment and concrete manufacturing and placing facilities before any actual dam building could begin. These operations produced a construction road with 32 switchbacks in the last three miles before the mixing plant site was reached at the 7757 ft elevation of the top of the dam; a mile-long tunnel from this site through a mountain into an adjacent valley at El 8500 where a suitable aggregate quarry site was located; a solid granite foundation for the dam after the removal of 675,000 cu yd of overburden and 273,000 cu yd of unsuitable rock; and all the units of a concreting installation planned to produce and place 7200 cu yd of concrete in two 11-hr shifts, or about 325 cu yd per hour.

Two sets of three 4-cu yd tilting mixers, set radially to discharge into central hoppers, comprise the mixing plant. Cement is supplied from two steel silos kept filled by two teleferiques over whose ropeways 10-sack cans of cement are delivered from Sion at the railhead 11 miles below. Aggregate from the trans-mountain quarry, where it is initially crushed to a 5-in. maximum size, comes in on a belt conveyor through the tunnel at a 525 cu yd per hr rate, and is further crushed, screened and washed to produce the four sizes of aggregate used—0 to ¼ in.; ¼ to ¾; ¾ to 1½; and 1½ to 5 in. Prepared aggregate is stored in timber silos 50 ft in dia and 66 ft

high from which it is fed by belt conveyors to the mixing plant.

To place the concrete, four 20-ton cableways of 2850-ft span and carrying 8-cu yd buckets were installed. They have a single, fixed head tower while their movable tail towers operate on a benched-out track on the far cliff face, which is inclined upstream at a 35% slope to save excavation and at the same time to permit the cableways to serve the progressive heights of the dam. Because of the ever-present danger of avalanches, all of these plant units had to be firmly anchored

How Grande Dixence Was Designed

Job Hunerwadel
Chief Engineer for Construction
Grande Dixence, S.A., Sion, Switzerland

Once the straight gravity type was chosen for Grande Dixence Dam, the designers had to fix the rules or conditions which the dam has to satisfy, and to determine the most economical section.

One criterion, which is at the same time a condition imposed by the Swiss government for dam designs, was that, with the reservoir full, the working stress on the upstream face at any given level should be greater than 85% of the hydrostatic pressure at that same level. A second criterion was that, for full reservoir plus earthquake effect, the resultant of all forces—dam weight, hydrostatic pressure and uplift—shall stay within the central two-thirds of each horizontal section.

In carrying out the design a specific weight of 153 lb per cu ft was used; the uplift was considered to decrease from a maximum at the upstream face to zero at the downstream face; and the earthquake effect was calculated according to the methods developed by Westergaard.

The following maximum existing stresses at the base of the dam have been calculated: for the empty reservoir at the upstream toe, 1,067 psi; for the full reservoir, earthquake effect and maximum uplift at the downstream toe, 1,849 psi.

The designers applied safety factors to such actual stresses as this to produce what we call the "design stresses." For the normal case, without earthquake effect, a safety factor of 4.2 has been fixed. For the case in which the earthquake effect has been considered the chosen safety factor is 2.8.

The design stress at the downstream toe of the dam was set at 4,980 psi; and at the upstream toe, 3,440 psi. The design stresses elsewhere in the dam were determined in like manner.

The rules of the Swiss government require that the 90-day strength of a 12-in. cube of concrete correspond with the design stress. Grande Dixence concrete was, therefore, designed—by varying the cement content of the mix—to have 90-day strengths corresponding to the design stresses. But while the concrete strength has been determined in the laboratory by testing 12-in. cubes, the daily concrete control on the site is done by testing cylinders 12 in. in dia and 18 in. high. The cylinder strengths are 85% of the cube strengths.

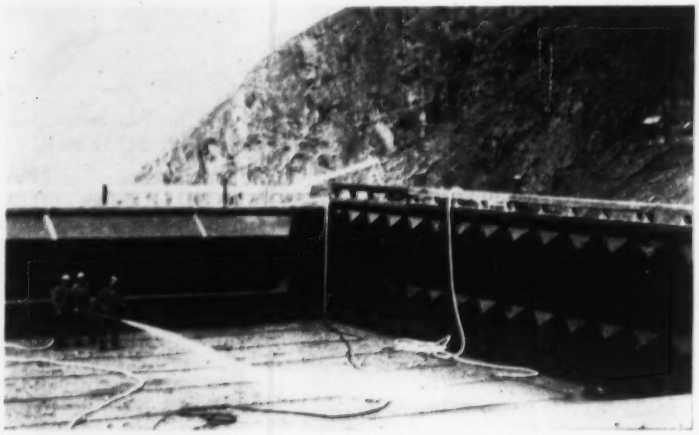
The medium cylinder strength at 90 days obtained by site tests over a period of one year has been 2,530 psi, with a cement content of 284 lb per cu yd; with a cement content of 386 lb it was 3,920 psi.

For the 4,980 psi design stress at the downstream toe, a concrete with a cement content of about 500 lb per cu yd will be required. It is also to be noted that compared to the concrete in the interior of the dam, the concrete for a 10 ft depth at the exterior faces contains 480 lb of cement per cu yd to improve watertightness and resistance to frost.

The concrete for the dam is mixed with a water-cement ratio by weight of 0.70 to give a slump of about 1½ to 2 in. The percentage of entrained air lies between 3.5 and 4%.

Internal vibrators operating at 12,000 to 13,000 vibrations per minute are used to settle each 2 ft layer of the concrete in the steel forms, which accommodate 10½-ft lifts. The forms are especially designed to produce effective construction joints between the vertical faces of adjacent blocks of concrete, as shown in picture below.

To assure a good bond between the different blocks, the longitudinal and transverse joints are grouted once the concrete is cooled down to its final temperature, which is the mean annual temperature at the location of Grande Dixence. Grouting is accomplished through a system of ¾ in. pipe coils placed in the joints with outlets each 10½ ft.



STEEL FORMS at Grande Dixence ready for another 10½ ft lift of concrete. They produce sawtooth transverse joints and diamond shaped longitudinal joints.

The horizontal surface of each lift is cleaned and roughened before the next layer of fresh concrete is placed by washing it with water propelled by compressed air from a hose. Depending on atmospheric conditions (temperature and humidity), this washing is done 3 to 5 hr after a lift is finished. This cleaned surface is then covered with about 1½ in. of rich mortar (1,130 lb of cement per cu yd) before concreting is resumed.

Coils of water pipes (¾ in. I.D.) are embedded between each 10½-ft lift to cool the concrete during initial set and for about six months thereafter. With the cooling water at a temperature of about 3 deg C, concrete rising to a temperature of 30 deg C has been cooled down to 5 deg C in six months.

to the foundation rock, and the roofs of vulnerable buildings strengthened.

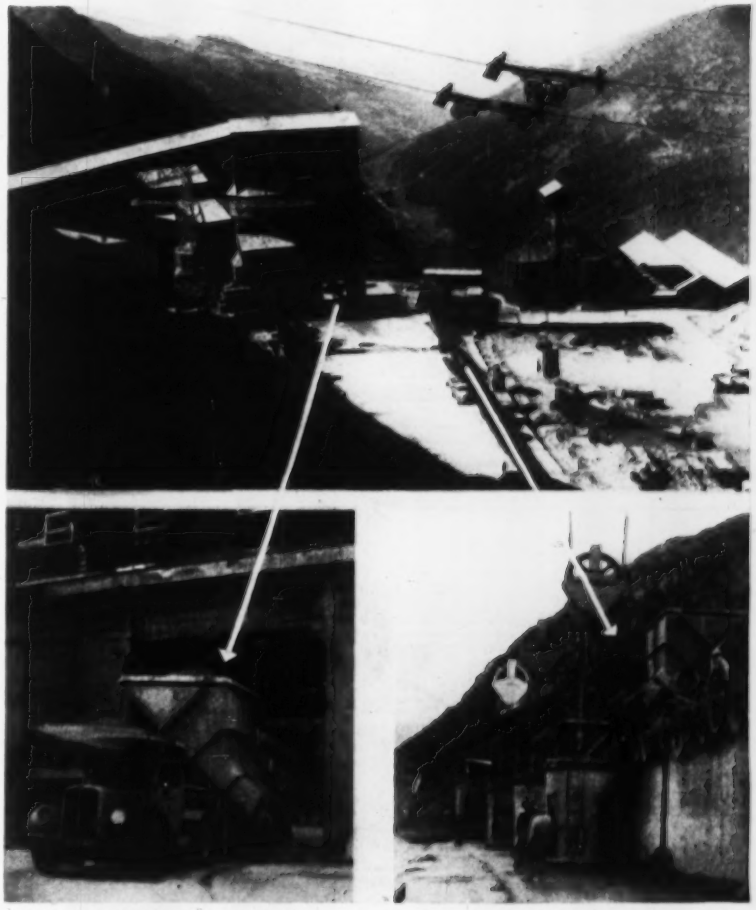
• **Dixence design considerations**—Since the dam which this construction plant is to produce will be the highest ever attempted (and the second largest in concrete volume), its section, design stresses and concrete strengths are matters of extreme importance. Compared to U.S. high dam practice, as exemplified, for example, by Shasta and Hoover dams, the upstream face of the Grande Dixence section is a distinct contrast. This face is vertical from the top down for 60% of the height, and below this level is actually off of vertical on a 3% slope downstream, an expedient that reduced concrete volume without exceeding design stresses.

The upstream faces of both U.S. dams, on the other hand, are flared upstream providing proportionately more section at the base. Thus Hoover is nearly as wide at the base as Grande Dixence, and it has been estimated that were Shasta's section to be projected to the same height as that of Grande Dixence, its base width would be about 20% greater. Thus by American standards the Grande Dixence is unusually bold.

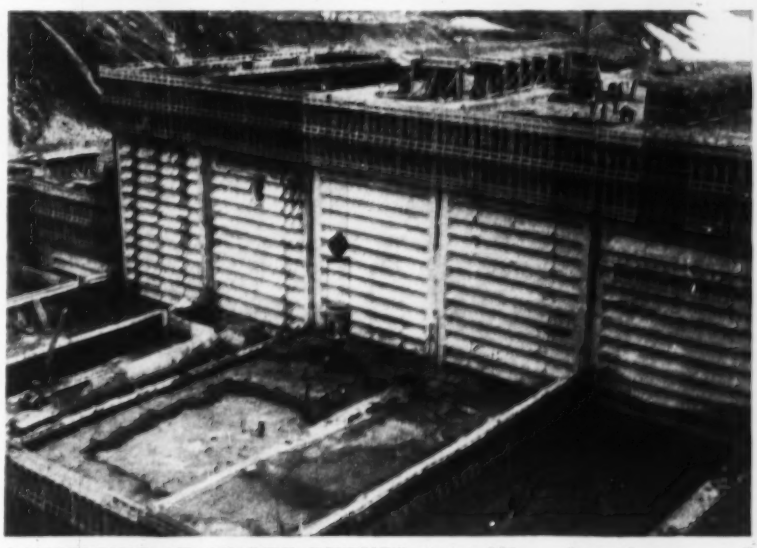
The criteria for the design of Grande Dixence Dam and the construction methods being followed to meet them are outlined in the box on the opposite page by the project's chief engineer for construction.

• **Progress at Grande Dixence**—Concreting at Grande Dixence has been under way for two working seasons of five months each. During these periods, all elements of the construction plant have functioned as planned, and produced up to schedule. In fact, mixing and placing has gone along with so few interruptions that there has not been enough "downtime" for the quarry and crushing plant to build up the reserve stockpile of aggregates. It had been planned to have this stockpile large enough that concreting could start in the spring before it was possible to open up the high level quarry. This plan worked the first year when the stockpile was full, but since then it has not been possible to replenish it.

In the quarry, twelve 13-cu yd trucks each make about 25 trips in an 11-hr shift, up and down a mile-long serpentine road between the face at the foot of a glacier and the primary crusher from where the rock is fed to the belt conveyor that takes it through the mountain tunnel to the dam site. Incidentally, the rock is heavy, about 2.67 specific gravity, since it contains magnetite, and an interesting sideline operation at the secondary crushing



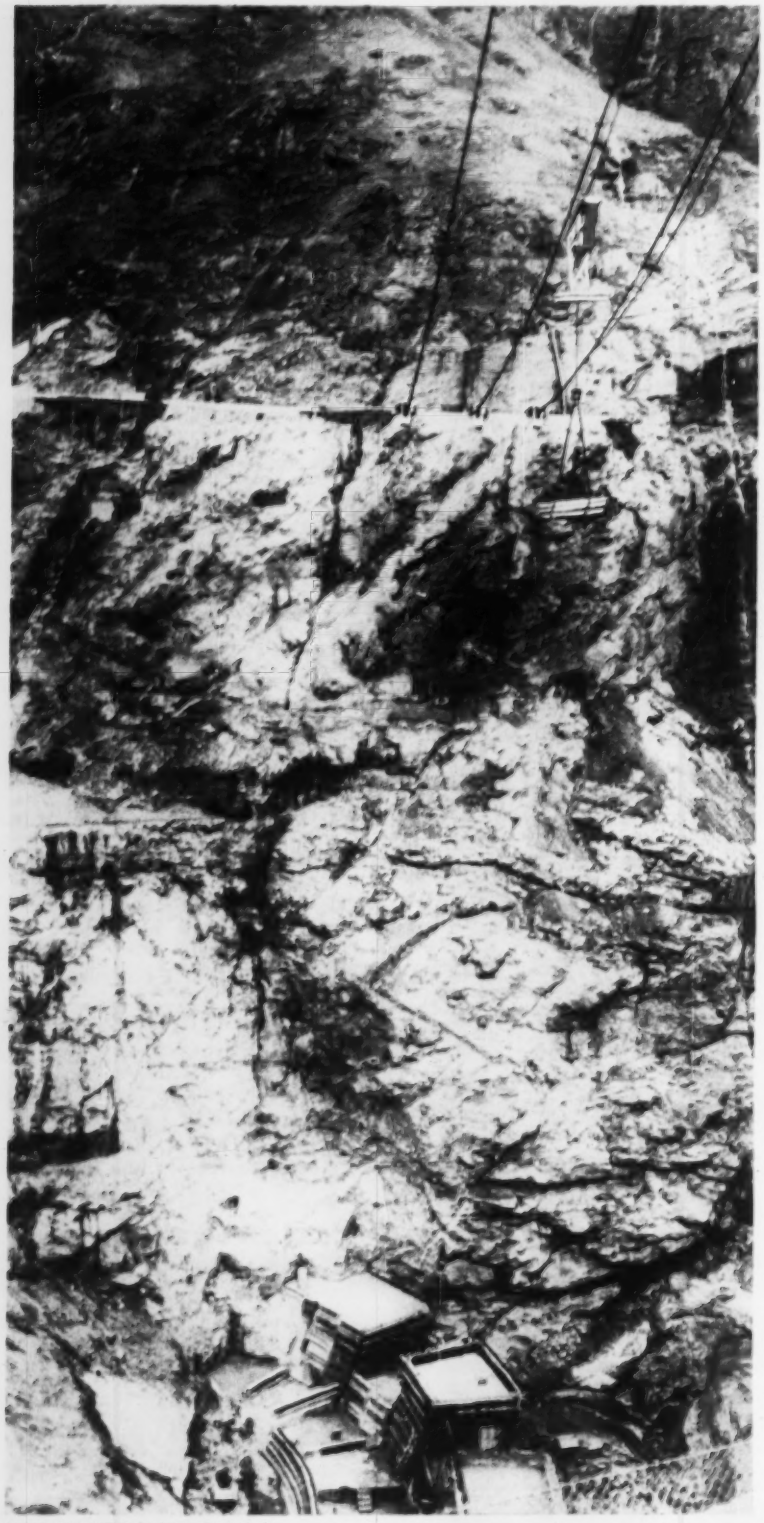
MIXING PLANT at Grande Dixence (top view) showing also loading dock for cableway buckets in foreground. The cement teleferique terminal is in right background. The lower views show (left) a concrete hopper truck leaving the mixing plant and (right) discharging into one of the 8-cu yd cableway buckets at the loading dock.



CONCRETING AT GRANDE DIXENCE attains 350-cu yd per hr rate as all operations mesh efficiently. Here, cableway buckets place concrete in two blocks at different levels, while special truck crane sets forms for a gallery at left, and workmen with high pressure air-water jets clean surface of another block at right. Note cooling pipes in this block on upper levels, and form panels ready to be set.

plant is to reclaim, for sale, iron particles from the crushed sand.

The concrete mixing and placing layout was planned for a maximum output of 7,200 cu yd in two 11-hr shifts. The maximum so far placed is 6,900 cu yd, but on several days last June 3,900 cu yd were placed in an 11-hr shift, demonstrating that production in excess of designed capacity is possible. An important contributing factor to this progress is the efficiency of the cableways in accurately spotting the buckets over the dumping points. Dials in the operator's cabins show the exact position of the buckets, horizontally and vertically, and telephone orders from the dam can be translated into minute movements immediately.



MAUVOISIN DAM begins to rise from this spectacular, sheer-sided hole in an Alpine canyon. The cableway anchorages are about at the ultimate top of the arch dam—a record-breaking 780 ft above the base.

About 600,000 cu yd of concrete was placed in 1955, and an equal amount is scheduled for this year. By July, 1957, it is planned to have the dam completed to a height of 584 ft, and by that time the generating plants will be far enough along to permit a start on power production. The longer range plans contemplate carrying the dam to a second stage height of 667 ft by 1959, and to its ultimate 922 ft height by 1966. Before the latter stage is reached the water collection tunnels to the east will have to be extended farther afield than shown in the accompanying map, and generally in accordance with the system shown on the map in the above-mentioned previous article.

• **World's highest arch**—Mauvoisin Dam, in contrast to Grande Dixence, will not be built in stages, but will rise to its ultimate height in one continuous operation. Thus, in addition to being the world's highest arch dam, it will hold the record for the world's highest dam of any type for several years before Grande Dixence is completed. Mauvoisin was originally scheduled to be finished in 1959, but the collapse of its concrete plant, in a tragic accident that took the lives of six men, set it back a full working season. But even 1960 will be at least six years before Grand Dixence reaches its full height.

Mauvoisin, located at a narrow point in the valley of the Drance River, will rise to the unprecedented height for a concrete arch dam of 780 ft. It will be only 181 ft wide at the base, but will nevertheless contain 2,800,000 cu yd of concrete because of its height and not inconsiderable crest length of 1,760 ft.

The geologic formation at the dam location is described as a Liassic calcareous schist, and the foundation and abutments of the structure are set deep into this material. In addition, the material was thoroughly grouted for distances varying from 500 to 800 ft from the rock surface against which the dam rests. Grouting tunnels were driven into the canyon walls—at the base of the dam, and about 250 ft down from its top—and from these grout holes totaling 125,000 ft were

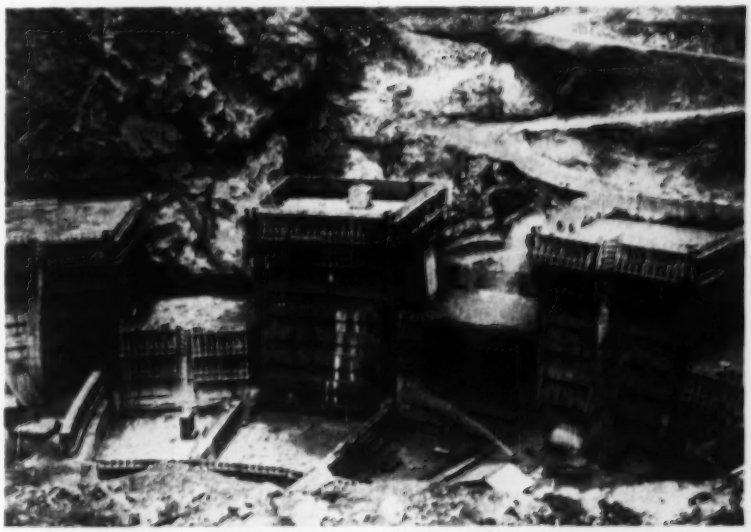
MAUVOISIN CONCRETE is made in this five-mixer plant (left) 700 ft directly above its huge aggregate supply (right) piled in the bottom of the canyon. Prepared in the crushing plant adjacent to the base of the pile, the aggregate is belt-conveyed upward to the mixers through a tunnel that zigzags back and forth in the canyon wall.

drilled. The total area of the grout curtain surrounding the dam is 2,000,000 sq ft.

Foundation preparation required that 1,145,000 cu yd of loose material and 560,000 cu yd of shattered rock be removed before dam concreting could begin. The resulting clean-shaven cliffs, rising sheer for about 1,000 ft on either side, and then sloping away only gradually for another 2,000 ft, furnish one of the most spectacular and difficult construction sites imaginable.

The reservoir provided by the dam (surface El 6,400 ft) will have a capacity of about 145,000 acre-ft, and will be supplied by a watershed, 41% of which is covered with glaciers. Part of this water flows directly into the reservoir from glacier-fed streams, and a part is supplied by collection tunnels about four miles long on either side of the valley downstream of the dam where they intersect other glacier discharges.

The power facilities, which this reservoir serves, include two generating plants at the villages of Fionnay and Riddes, as noted earlier. A 10-ft dia three-mile tunnel from the dam feeds the Fionnay plant, while a similar size tunnel nine miles long connects Fionnay and Riddes. The latter ends in two 5½-ft dia steel penstocks at the plant, from which water is discharged in a 3,600 ft canal into the Rhone River. This power setup is planned to produce 595,000,000 kw hr during the winter and 166,000,000 kw hr in the summer of an average year.

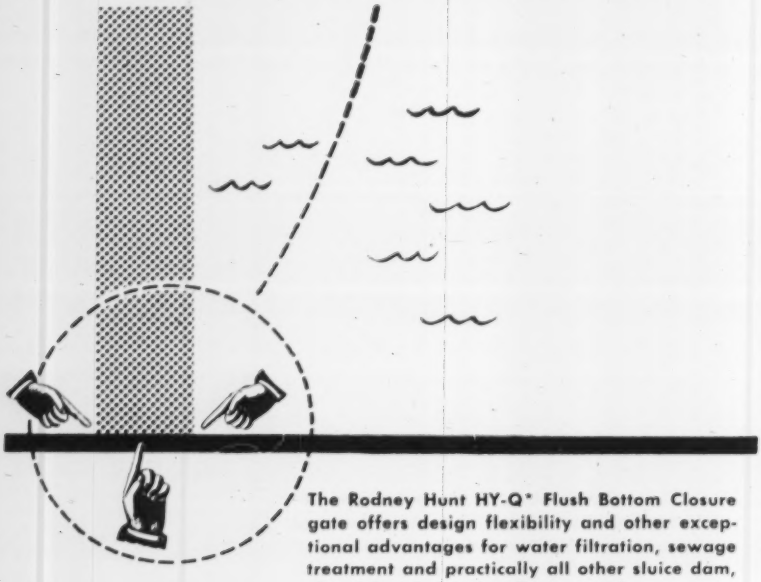


SET DEEP into canyon walls and bottom, Mauvoisin Dam is being concreted in sector shaped blocks whose size is fixed by a 59-ft spacing of the radial joints.

Concreting of Mauvoisin Dam had only risen 50 to 75 ft above the foundation when work was shut down for the winter, but everything is in readiness for fast progress in the coming working season. Aggregate preparation, for one thing, is far advanced thanks to the stockpiling of all of the quarry output for the entire dam. This huge pile of stone, almost a dam in itself since it nearly fills the valley just downstream of the Mauvoisin site, was created because the quarry is upstream where it would be inaccessible after actual dam construction started. After primary crushing at the quarry the rock was trucked down a winding valley road to the stockpile.

Secondary crushing facilities at the stockpile produce five sizes of aggregate—0 to ¼ in.; ¼ to 0.4 in.; 0.4 to 1.2 in.; 1.2 to 2.4 in.; and 2.4 in. to

the HY-Q Sluice Gate seats flush on the bottom of the channel!



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4.5 in. These aggregates are carried to the bins of the mixing plant, 700 ft directly above, on numerous short flights of belt conveyors installed in a tunnel that zigzags back and forth in the rock of the canyon wall. Cement comes to the valley floor on a teleferique from the railhead nine miles away, and is stored in 5,000-ton silos until it is pumped up into the bins of the mixing plant.

The mixing plant contains five 4-cu yd tilting mixers, set radially and geared to a production of 7,800 cu yd in two 10-hr shifts per day. As at Grande Dixence, the concrete is discharged into hopper trucks which move only a short distance across a platform to the cableway loading point. There are three fixed cableways of a German make in which the anchorages consist of tunnels in the canyon walls. Of 20-ton capacity, the cableways carry 8-cu yd buckets.

While Mauvoisin Dam is being built it is protected by an upstream cofferdam which diverts the Dranse River into a tunnel around the right abutment of the dam. In the completed installation this diversion tunnel will become the bottom discharge for the reservoir.

Boiler-Water Treatment Plant Stresses Demineralizing Steps

The boiler-water treatment plant now being designed for the new Linden, N. J., power station of Public Service Electric & Gas Co. will feature extensive demineralizing facilities.

Providing for 3,200 gpm, or 4.6 mgd, the waterworks will contain clarifying and filtration tanks followed by cation, deaerator, anion and polishing units. A 62-ft-dia clarifier surrounded by two peripheral filters, each 50 ft long on an arc and 10 ft wide, is to be enclosed in an 82-ft-dia steel cylinder 18 ft high. There will be two such units, each also containing annular compartments for backwash recovery water and filtered water storage.

Demineralization will be begun in seven cation units followed by a 14-ft-dia vacuum deaerator. Water will be pumped through six combination weak-base and strong-base anion units and finally through a battery of five mixed-bed polishing demineralizers. All exchange units are to be rubber lined and fully automatic.

While raw water is high in solids and color, the treated boiler makeup water, for use at 2,700 psi, is not expected to exceed 0.01 ppm silica, 0.1 ppm dissolved oxygen and 0.2 ppm total dissolved solids.

Cochrane Corp. of Philadelphia is designing and manufacturing the installation.

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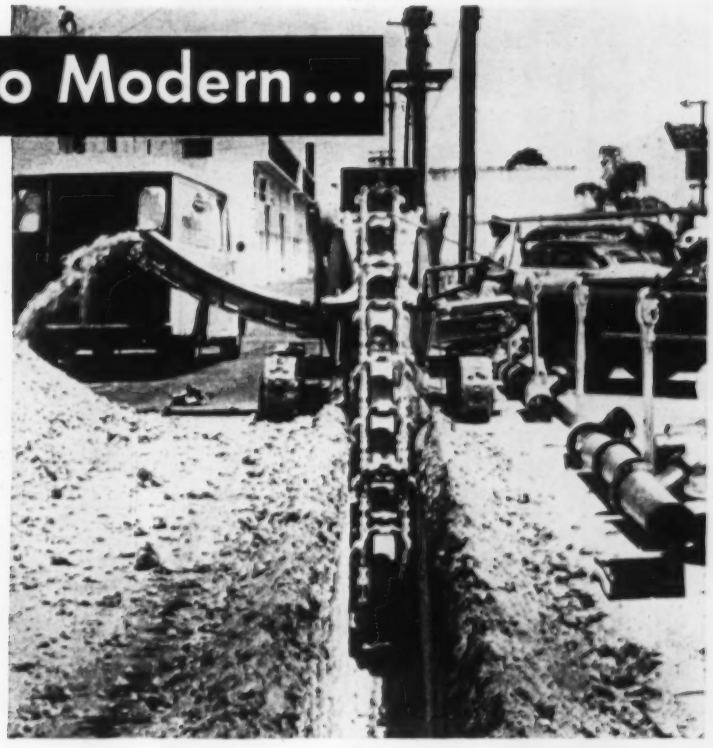

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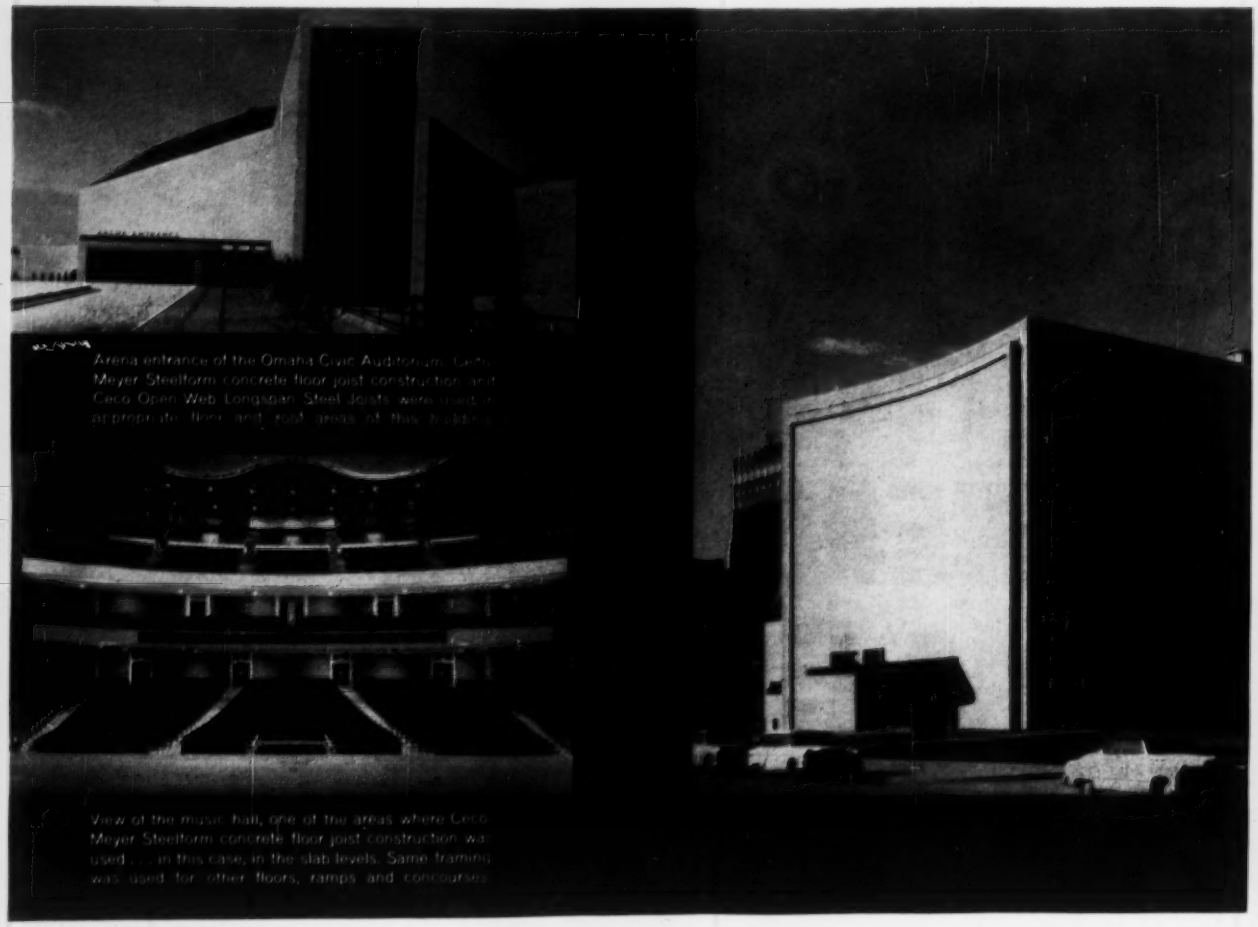

Arena entrance of the Omaha Civic Auditorium. Ceco-Meyer Steelform concrete floor joist construction and Ceco Open-Web Longspan Steel Joists were used in appropriate floor and roof areas of this building.

View of the music hall, one of the areas where Ceco-Meyer Steelform concrete floor joist construction was used . . . in this case, at the slab levels. Same framing was used for other floors, ramps and concourses.

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Ceco helps architects, engineers and contractors meet schedules for finest buildings. It takes a lot of material to build a safe public structure of ten million cubic feet. Weight could be a problem. That was the condition confronting Leo A. Daly Company, architects and engineers, in designing the Omaha Civic Auditorium. They determined 30% in concrete load could be saved by using Ceco-Meyer Steelform concrete joist construction for floors, concourses, ramps and balconies. Similar weight savings were made by using Ceco Open-Web Longspan Steel Joists in areas of the roof. Architect Daly put it this way:

"Metal pan rib floors were used where loading and span permitted. Though the weight is light, the depth of the floor produces great rigidity. Formwork is economical, requiring only a simple centering board for the soffit form under each rib or joist. Longspan Steel Joists used in appropriate roof areas cut weight, too, as compared to heavier standard truss and purlin construction."

When Peter Kiewit Sons' Company set up the building schedule, Ceco service went into action, delivering all material as needed—on time. For the best in floor framing methods and service, call in your Ceco Engineer.

This is the Omaha Civic Auditorium, showing the music hall entrance at left and the exhibit hall entrance at right. Leo A. Daly Company, Architects and Engineers; Peter Kiewit Sons' Company, General Contractors.

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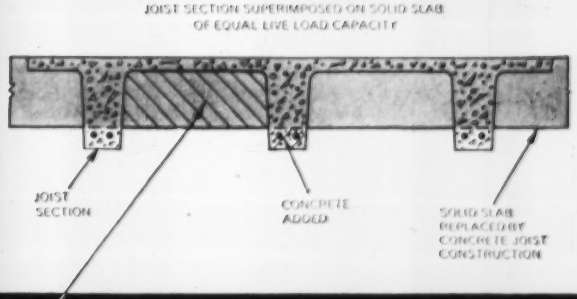
JOIST SECTION SUPERIMPOSED ON SOLID SLAB OF EQUAL LIVE LOAD CAPACITY
JOIST SECTION
CONCRETE ADDED
SOLID SLAB REPLACED BY CONCRETE JOIST CONSTRUCTION

HERE'S THE ECONOMY OF CONCRETE JOIST CONSTRUCTION

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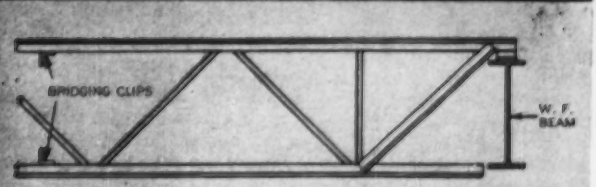
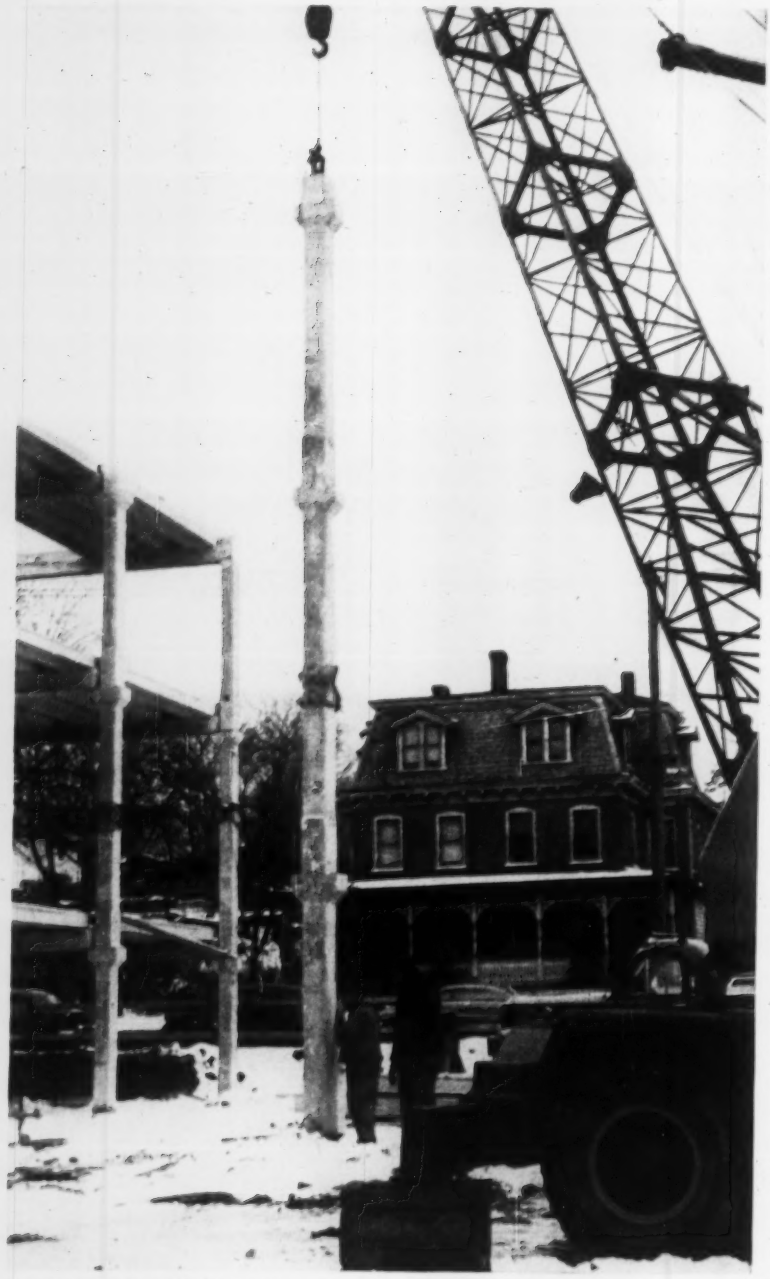


STEEL JOIST CONSTRUCTION SAVES WEIGHT

Open-Web Steel Joists comprise the lightest standard construction and cut framing time by months, compared to heavier, slower methods. They permit wide open floor areas with fewer columns.

Winter and snow generally halt concrete work, but on this concrete building in Bridgeton, N. J., columns, beams and floor members were precast and shipped to the site from 30 miles away. As a result . . .

Sixty-Six Precast Bays Go Up in 11 Days



PRECAST COLUMN, 38 ft long, dangled from the end of a crane hook as new bay of precast building was started. Column has brackets along its length to seat beams.

Sixty-six, three-story bays in reinforced concrete—complete with precast channels as base for the deck—all erected in 11 days, spells speed in any builder's book. And that is the erection time for a new 120 x 220-ft warehouse and industrial building for the M. C. Schrank Co. at Bridgeton, N. J.

Key to fast erection was the use of all precast components. Precast, 38-ft-long columns support 19-ft precast, pretensioned beam soffits that, in turn, carry 1½-in.-thick, precast channels, 24 in. wide by 10 in. deep by 19 ft 4 in. long. These channels form the base for a 2-in. cast-in-place concrete topping that comprises the floor surface. The prestressed, precast beam soffits form the bottom half of the web of a composite T-beam, completed when the topping was placed. Beam soffits were prestressed to carry both the dead load of the channels plus that of the topping. Prestressing was accomplished by tensioning sixteen ½-in. bridge strands.

All precast components, including the 38-ft long, 12 x 14-in. columns, were cast in the Berlin, N. J., casting yard of the Formigli Corp. 30 miles away and shipped to the site by truck.

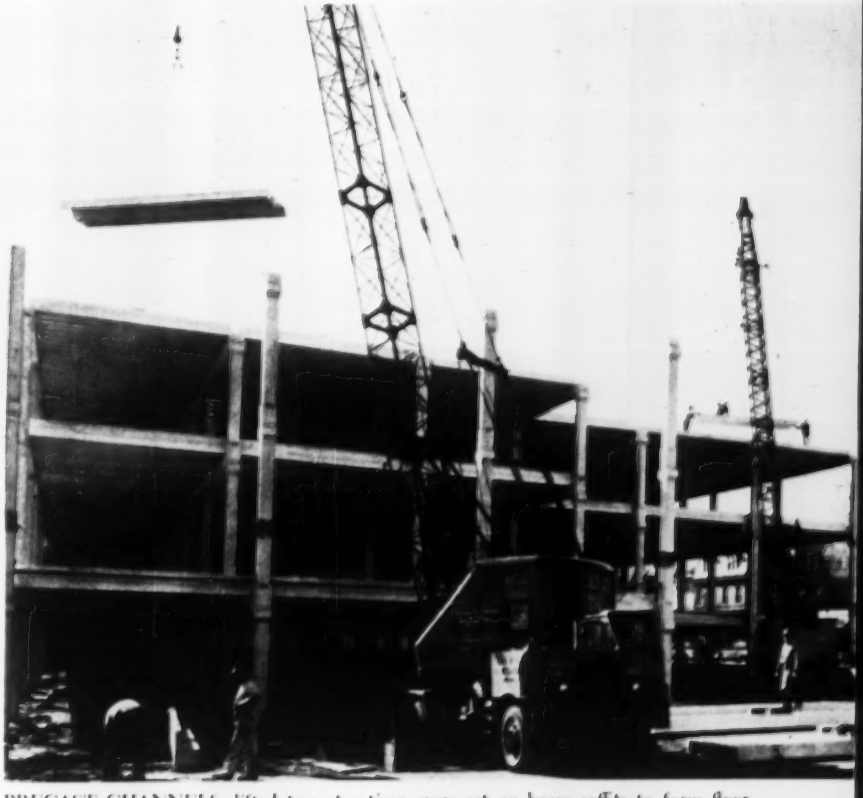
To the observer, erection of the building looked as simple as ABC. First, the columns were lifted by one end by a truck crane and swung over the footing. (Footings are pile-supported pile caps.) Guided by workmen, the column was lowered so that its steel base plate slid over four anchor bolts. Once the column was in position, these anchor bolts acted much like the leveling screws of a transit, permitting the men to plumb the column. The column was permanently seated by packing a dry grout between the base plate and the footing.

Each of the long columns had haunches (brackets) to receive the prestressed beam soffits, which were next on the erection agenda. These 19-ft-long, 16 x 14-in. members were also lifted by truck crane and easily swung into position to rest between columns on haunches. Once in position they were fixed by welding steel plates on the underside of the beam's ends

LOWERED onto footing, column base plate was eased over four anchor bolts. Bolts act as leveling screws in plumbing column.

PRESTRESSED BEAM SOFFIT, lower part of the stem of a T-beam, was seated on column brackets.

WELDER joined plates under end of beam soffit to those on beam seat.



PRECAST CHANNELS, lifted two at a time, were set on beam soffits to form floor deck. Two truck cranes worked in tandem on different parts of the building.

to corresponding plates on the column seats. A series of stirrups protrude from the top surface of each beam soffit to take the shear between the beam and the upper part of the T-beam, which was cast later.

With columns in place, and joined horizontally by beam soffits, the erector then was ready to put down the precast channels. Two truck cranes, working in tandem on alternate parts of the building, speeded the operation. The channels were picked up by the truck crane—two at a time—and swung into place to lie transversely, supported at their ends on the beam soffits.

Ends of adjacent bays of channels did not butt flush on the top of the beam soffit, but instead were separated by an 8-in. gap. This gap provided a shear lock between the beam soffit and the cast-in-place topping—giving in effect a beam action in the beam soffit direction. Holes sleeved through the columns permitted the placing of negative steel to give continuity for live loads as well as to provide a tie across the columns.

Finally, concrete was cast to fill the gap between the ends of the channels and form the upper half of the I-beam web—the flange of the T being completed by the 2-in. topping surface. Since the channels were open at one

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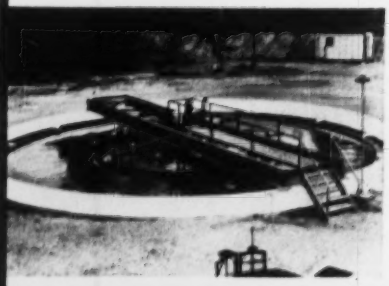

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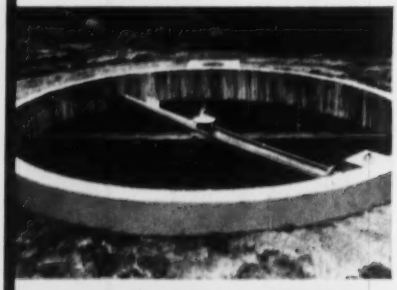

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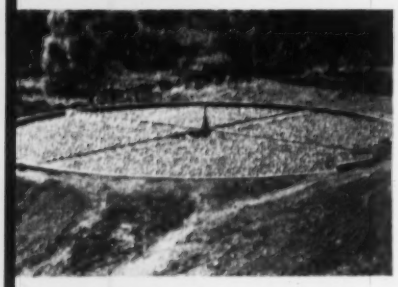

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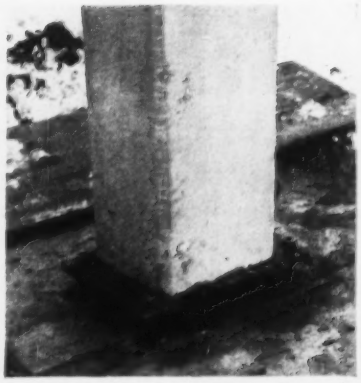


COLUMN was plumbed by leveling nuts under base plate. Guy wires were used to steady the column once plumbed.

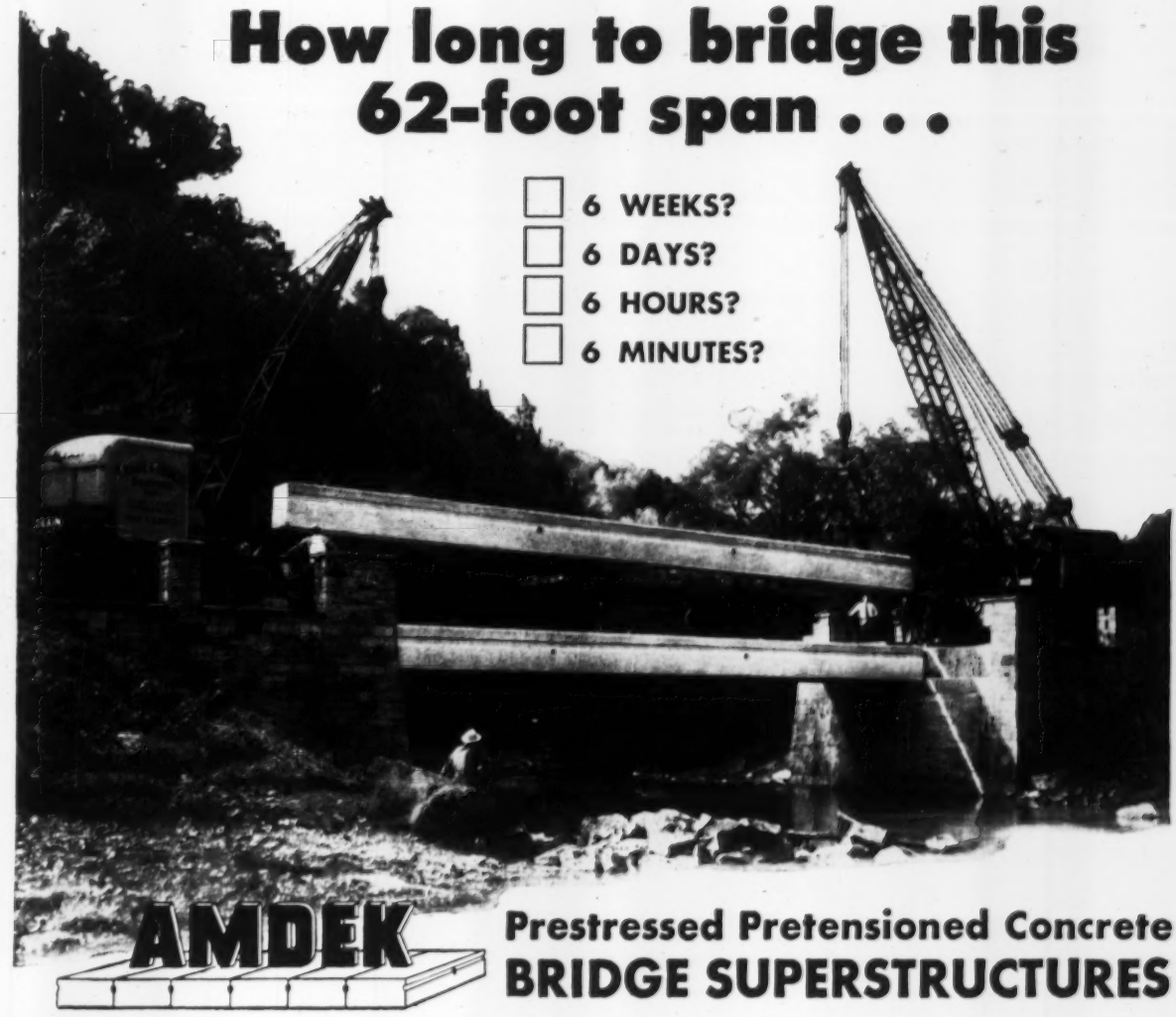
BASE PLATE was given firm seat by dry-packing grout underneath. Wood spacer bars assured alignment.

GAP between ends of precast channels above beam soffit later was concreted with topping, completing the T-beam.

end, it was necessary to use temporary filler blocks to close off this opening during casting.

Messick Brothers, Bridgeton, N. J. were the general contractors. Engineers for the prestressed concrete were Keast & Hood, Philadelphia, Pa. The Formigli Corp., also of Philadelphia, fabricated and erected the precast components.

How long to bridge this 62-foot span . . .



AMDEK Prestressed Pretensioned Concrete BRIDGE SUPERSTRUCTURES

6 HOURS! That's the remarkably short time it took a few workmen to span Laurelhill Creek near Somerset, Pennsylvania with the longest prestressed bridge in the state. Seven "factory-built" AMDEK sections were swung by cranes into position on offsets built into the old bridge abutments. After a few finishing touches, the bridge was ready for use!

Prestressing, pretensioning and vacuum processing—plus the use of special voids—results in a stronger, lighter bridge member that can be handled by contractors like steel beams—in any weather. You save time, cut costs—build beautiful bridges that give perfect, maintenance-free service for years! Find out more about AMDEK Bridges . . . write for literature and all details.

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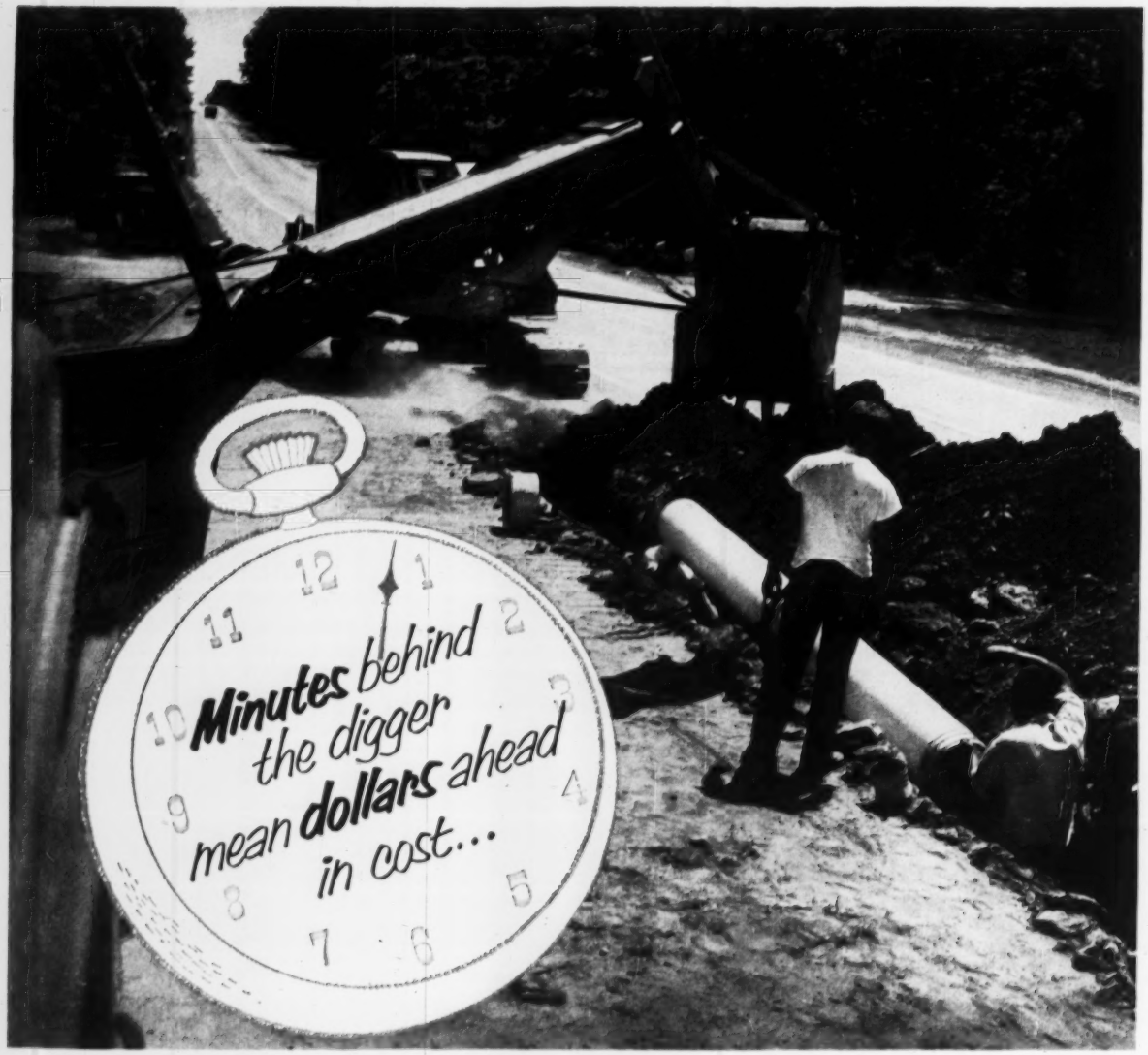

...*because* Transite® Pressure Pipe goes in fast, pushes the excavator

HANDLING and assembly of Transite Pressure Pipe and the Ring-Tite® Coupling are so simple—and yet so sure—that the laying crew can install the pipe as fast as the trench is opened. This means less time on the job, means *appreciably lower* costs.

The Ring-Tite Coupling makes consistently tight yet always flexible joints with automatic positioning of pipe ends within the joint. And rubber rings can't blow out.

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For further information about Transite Pressure Pipe and Ring-Tite Coupling, write for Booklet TR-160A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit, Ontario.

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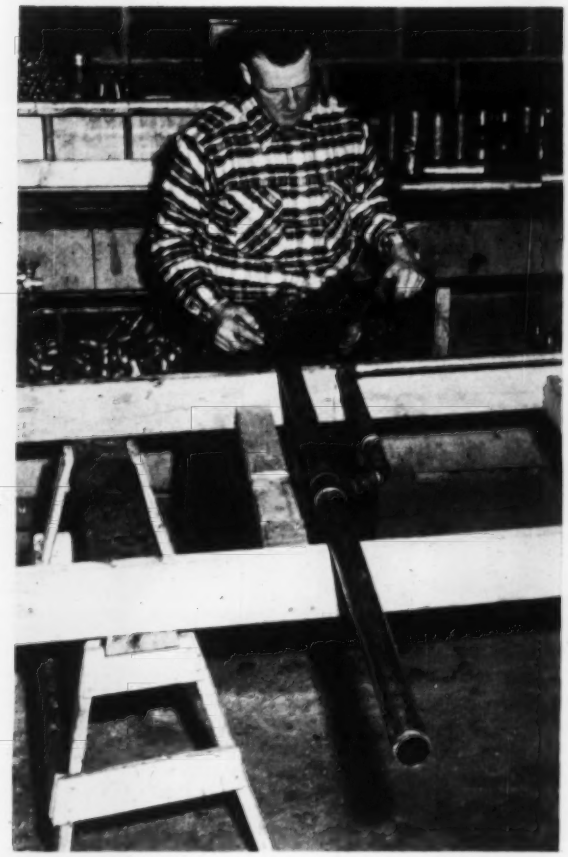
WITH THE NEW RING-TITE COUPLING



PREFABRICATED in a shop . . .

PIPES are quickly installed in new home.

Prefab Plumbing Trims Housing Costs

THIN-WALLED TUBE for 3-in. vent requires no special build-outs to fit.

Plumbing is going in at the rate of 40 homes per week in a 2,600-home project in Jericho, N. Y. And when final figures are in, the builder expects significant savings in money as well as time.

The keys to this plumbing success are: (1) prefabrication of plumbing assemblies in a shop at the site, and (2) use of a new series of copper tubing for drainage, waste and vent lines.

Plumbing assemblies were solder-assembled in special jigs. With eight different split-level and ranch-type homes being constructed—most with 2½ or 3 bathrooms—it was necessary to have a variety of jigs on hand in the shop. Each assembly was keyed to the type of house and location of the bathroom by an inventory maintained in the storage area.

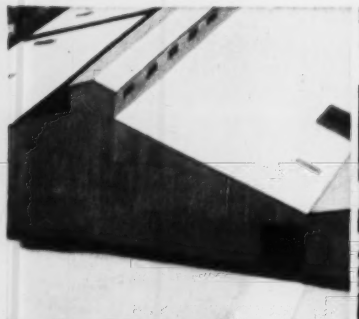
A supply truck delivered the assemblies, fittings and tubing (already cut to size), to the workmen as they progressed from one house to the next. As the plumbers always had supplies on hand, there was no time lost waiting for materials. Nor were there shutdowns because of bad weather either, for the men could work in the shop, building up stock of prefabricated assemblies.

Introduced last year, the new series of drainage and vent copper tubing differs from other types in its wall thickness. Thinner walled tubing is satisfactory for drainage, waste, and vent lines since these are non-pressure lines. Inherent advantages of the copper tubing are its light weight (a 20-ft length of 3-in. tube weighs under 34 lb), as well as corrosion resistance and smooth interior bore to prevent clogging. Also, a 3-in. copper tube will fit into a 2x4-in. stud wall without requiring special build-outs or extra furring.

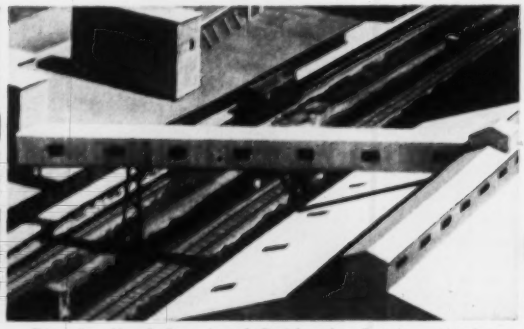
The new tubing is called Copper Drainage Tube DWV. It was used by Horowitz Brothers, Inc., plumbing contractors on the job. Morris Sosnow and Leonard Schwartz are the builders of the project, Birchwood Park Homes.

Can standardized structures meet the custom requirements of a complex fertilizer plant? The answer proved to be "Yes, emphatically!"

WHY DIXIE GUANO COMPANY CHOOSES LURIA BUILDINGS

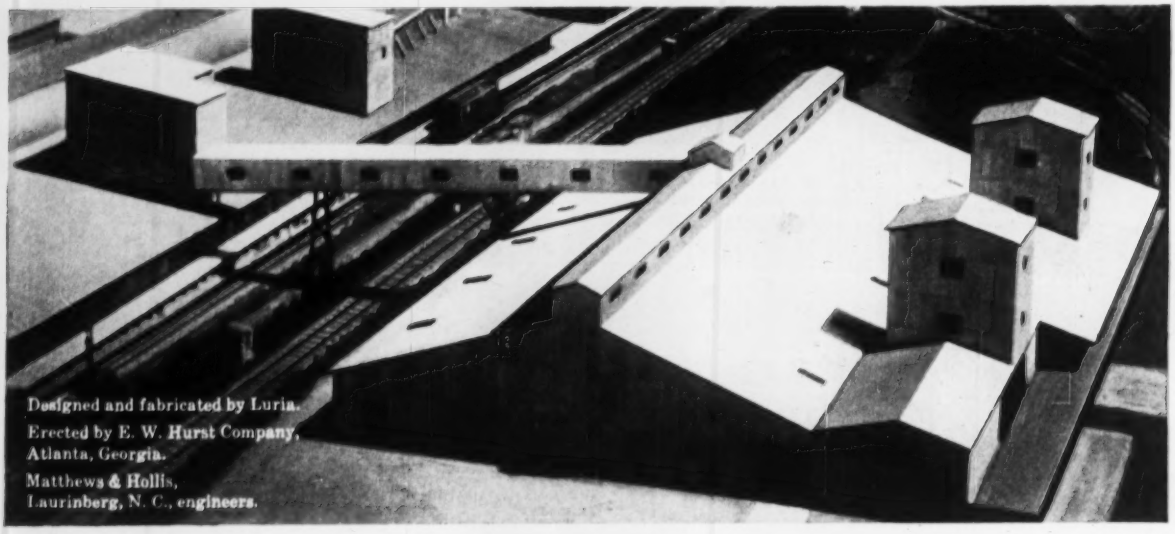


Bulk Storage Area with capacity of 12,000 tons of fertilizer can be filled during seasonal lulls by a single man.



Standardized Overhead Bridge by Luria contains conveyor belts that efficiently transport materials from the processing plant to the shipping center.

Multi-Story Buildups, adaptable to *individual* needs, house special processing machines.



Designed and fabricated by Luria.
Erected by E. W. Hurst Company, Atlanta, Georgia.
Matthews & Hollis, Laurinberg, N. C., engineers.

Luria unites high speed, low cost construction with the special design requirements of custom building.

"Customized" to your *individual* needs, "standardized" to bring speed and economy to your expansion program—these are just two of the many advantages provided by Luria structures.

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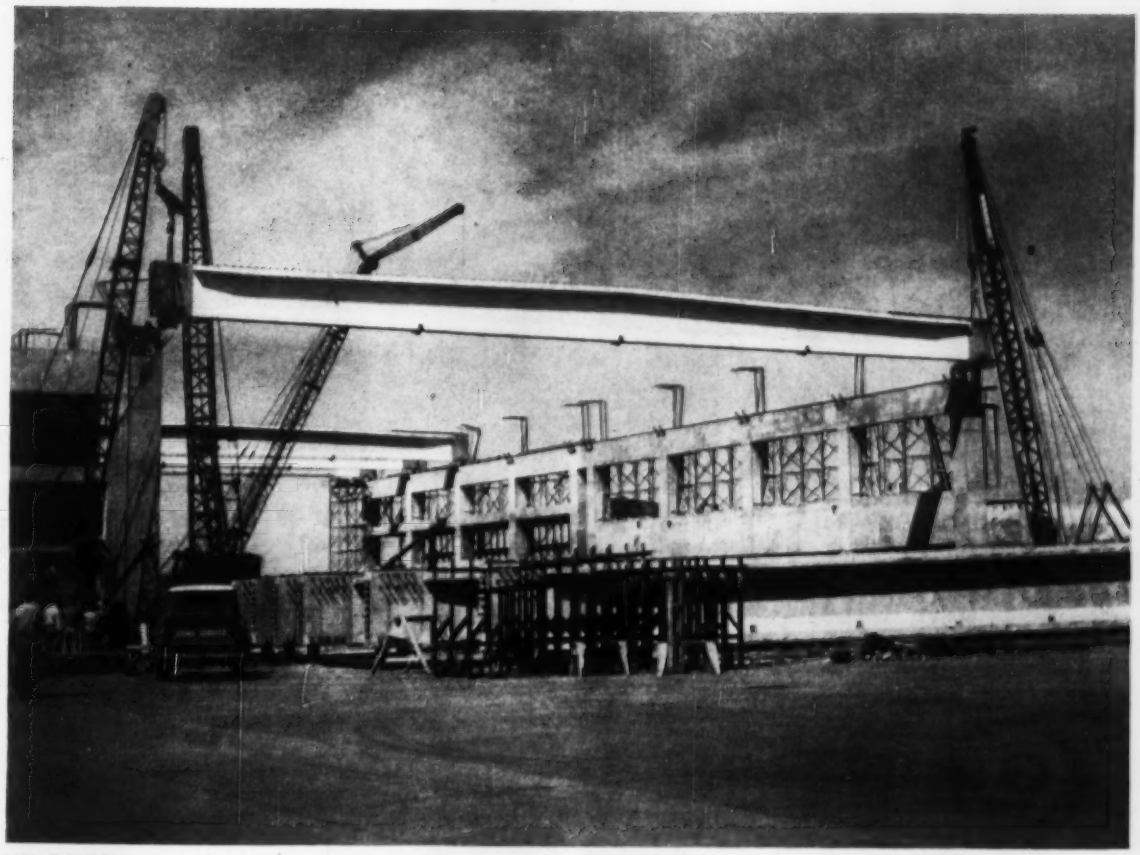


UP GOES one of the 136 ft long concrete girders for Air Force hangar in Utah. All girders were lifted at end of building, then moved to position on dollies.

Precast, then post-tensioned in two steps—

84 Tons of Girder Sets Record

Ten 136-ft, precast, post-tensioned girders were successfully positioned on the roof of a special-purpose hangar at Hill Air Force Base in Ogden, Utah, late in March. The 84-ton units are believed to be the biggest concrete girders ever precast for a building. Joined integrally to the supporting columns, they provide a rigid frame structure.

The heavy, long girders, temporarily fitted with dollies at either end, were hoisted 40 ft to roof level by a team of one 50-ton crawler crane and two 35-ton truck cranes. Here, the dollies were set on rails laid atop the spandrel beams, and the girders moved down the building to their final positions. The dollies were also used at ground level to permit movement of the girders from casting position to storage and then to erection position.

Hill Air Force Base is a major plane maintenance and overhaul installation of the Air Force's Air Materiel Command. The new hangar will be used for the cleaning and painting of planes. Included is a substantial installation of mechanical equipment to render air in the hangar suitable for those operations.

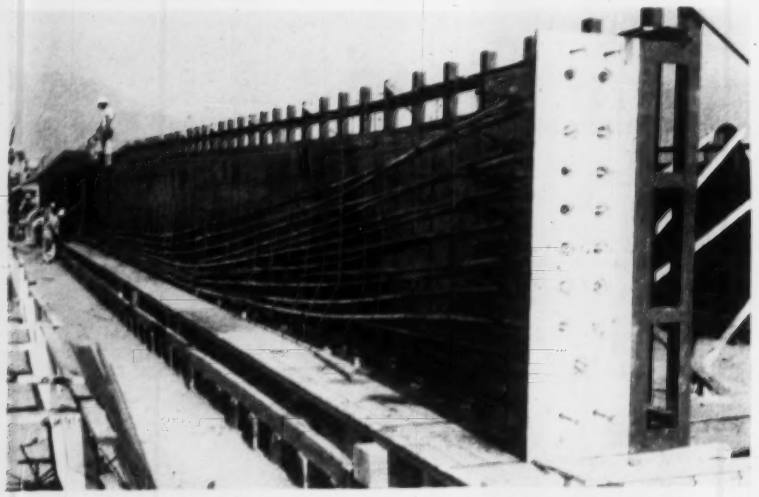
The main work space is 274 ft long and is divided into two sections—one for painting and one for cleaning—by rail-mounted doors at the middle. Width is 130 ft face to face of columns, and clear height to a suspended ceiling is 38 ft. Lean-to structures at each side provide space for shops and mechanical equipment making the overall width of the building 242 ft. The west lean-to is structurally independent of the hangar, except for common footings. The smaller east lean-to uses the hangar columns in its framing system.

Nature of the air-cleaning equipment established column spacing at about 32 ft, with four bays in each end of the hangar. Two columns are adjacent to the mid-building rolling doors. This resulted in the use of ten prestressed girders—six support a full bay roof load and four support the load from only half a bay.

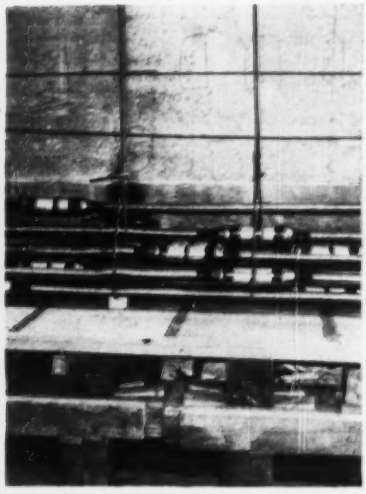
Spanning between the girders are precast, ribbed roof slabs nearly 11 ft wide and weighing 6 tons each. This makes the roof dead load 72 tons for each of the interior girders.

• **Erection procedure**—The major problem facing the contractor—Jacobsen Construction Co. of Salt Lake City—on the $2.5 million building was girder erection. Casting the big units in place would, of course, have been prohibitively expensive because of the falsework required. And substantial lateral movement of the girders during the erection procedure would have been risky. For this reason, the Jacobsen people developed the rail movement procedure.

To support the heavy girders during



PRESTRESSING RODS were supported in the forms in parabolic patterns. All reinforcing was placed against one side form, after which the other form was installed.



ROD SPLICES were staggered near mid-point of the 136-ft long girders.

movement at roof-top level, size of the spandrel beams was increased at the cost of the contractor. Original design called for beams 1 ft wide by 2 ft deep. These were beefed up to 5 ft depth.

Rails used at roof top level and at ground level are to be later installed to support the heavy hangar doors.

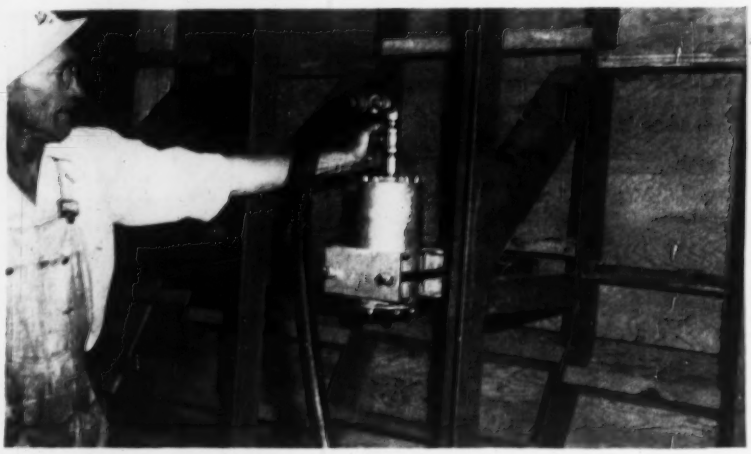
The contractor assembled two sets of girder forms and installed two casting positions. Concrete slabs were laid to support the casting work.

Running through the casting positions are two rails, one at each end of a girder. The rails are mounted on 18-in I beams that in turn are placed on a concrete slab. The rails permit lateral movement of the girders after stressing. And the concrete slab serves as a base for storing the girders until ready for erection.

Forms (for two girders) were plywood faced and braced on the outside by light steel frames. One side form was erected, after which the prestressing rods (1¼-in. dia) and the other beam reinforcing were placed. Then the second side form was erected.

Concrete came from a batch-and-mix plant located only a few feet from the girder casting position. The mix was hauled in buckets by rubber tired carriers and hoisted to the pouring position by crane. Concrete was vibrated by external machines at the start of a pour. After the mix covered the tendons, internal vibration was used.

After the concrete had cured to 4,000-psi strength, a girder was stressed—but only to about 65% of ultimate full stress, which will be explained later. Then the girder was jacked up and placed on dollies, and hand winches hauled it to the storage



EXTERNAL VIBRATION was used until concrete extended above prestressing rods. Then internal vibration followed.

position where it was rested on steel pedestals—the same pedestal units that would be installed in the building.

The same procedure was then followed for a second girder, which, after completion, was winched over the first girder's soffit forms to the storage position. In this way, all ten girders were cast two at a time, with the last two left in casting position until moved for erection.

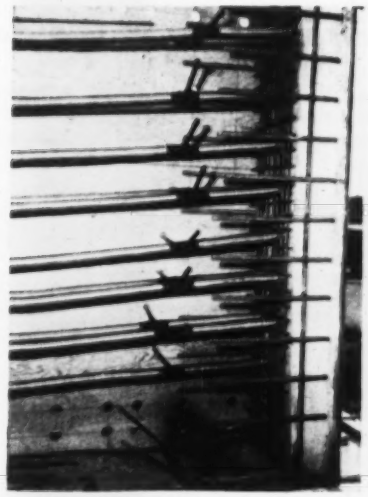
While the girders were being cast and stressed over a period of several months, the rest of the building frame was constructed.

Erection of the heavy, long units took a week's time late in March. Lifting each unit—as previously mentioned—was a team of three mobile cranes, one 50-ton crawler crane and two 35-ton truck cranes. The cranes were positioned for the first lift and left in that position until all ten girders were hoisted. Hoisting seemed simple, but it was a carefully planned team effort on the part of the subcontractor—Shurtleff & Andrews of Salt Lake City.

The girder design required that the prestress load be balanced by the dead load at all times. Thus, the girders could be handled with lifting connections attached at each end only. The dollies were hoisted with the girders, lifting slings being attached to pins in the dollies.

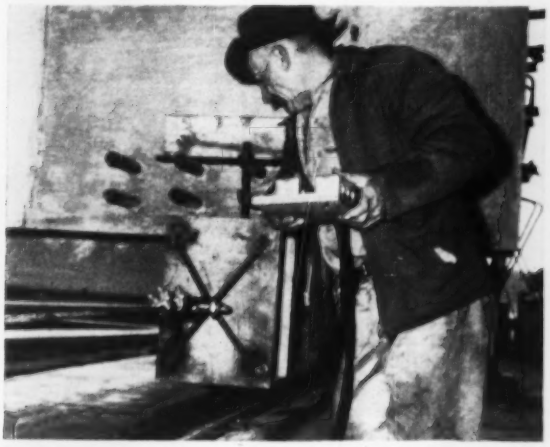
The first unit was hoisted direct from its storage position to roof top level. Succeeding units were winched down the storage yard rails to the same hoisting position.

Once a girder was at roof level, it was pulled along the building to final position. Power for this movement came from two ½-hp motors. The 1,750 rpm speed of the motors was geared down to 1 rpm. Speed of the movement was 16 in. a minute at

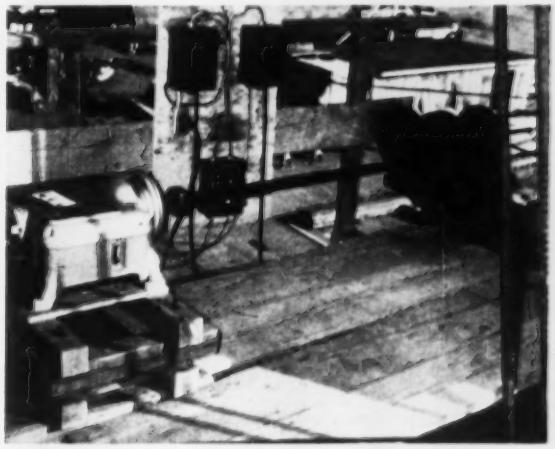


ANCHORAGE of prestressing members. Prestress rods are sheathed in flexible metal tubing.

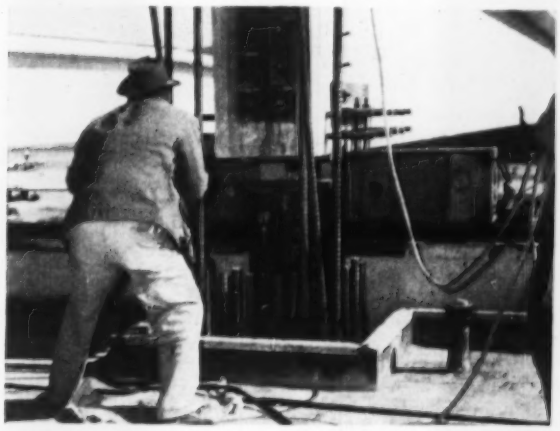
CONCRETE WAS PLACED by crane-suspended bucket, which was transported by rubber-tired carrier from mixing facilities nearby. After the concrete reached 4,000 psi, prestress was applied.



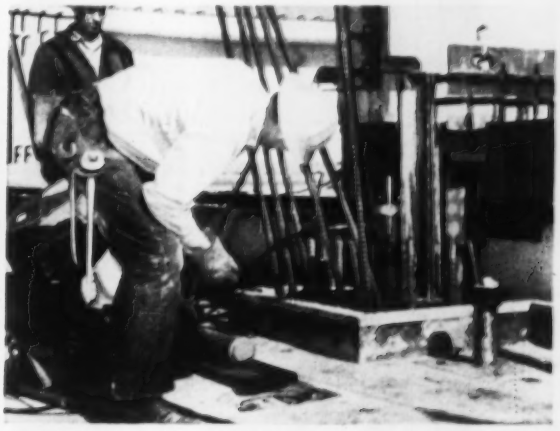
SWITCHES CONTROL MOVEMENT of girder along rail on top of building. P. A. Maxwell, superintendent for Jacobsen Construction Co., controls motors.



POWER FOR GIRDER HAUL comes from ½-hp motor. Gearing reduces 1,750 rpm motor speed to 1 rpm for relatively slow girder pull.



GIRDER PIN is carefully spotted over pin hole in supporting pedestal. After all the load is on the girders, final post-tensioning is done.



GIRDER IS JACKED UP to permit removal of dolly; then jacked down onto pedestal. Jack is same 60-ton unit used to apply prestressing force.

the start and 3 ft a minute at the end, as the ½ in. cables wound on their drums.

Switches controlling both hauling motors were mounted on a small board. One man handling the two switches was thus able to control movement of the girders.

Major item of importance in the movement was to keep the ends of the girders moving at the same speed to prevent a skew alignment. Some minor difficulty was encountered on the first girder by binding of the flanges of the dolly wheels on the rails. One set of wheels had to be replaced after the first movement because the flanges broke off.

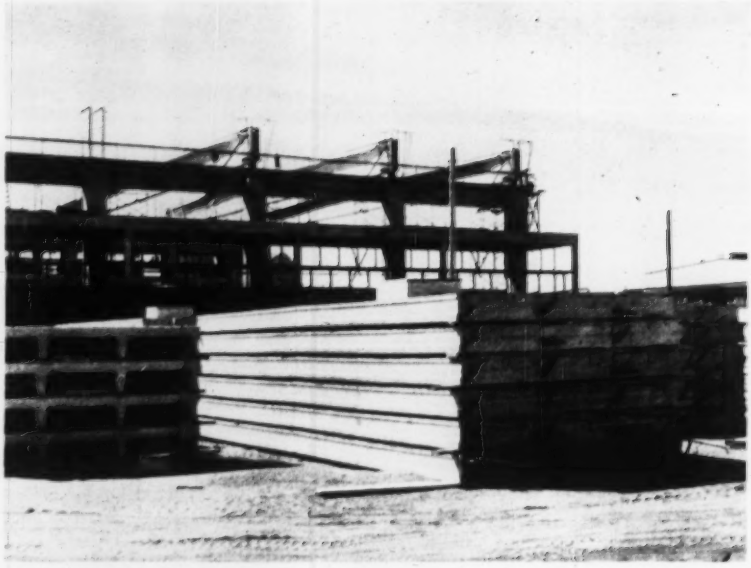
When each girder arrived at final position it was jacked up to permit removal of the dollies. Then it was jacked down onto its pedestals. The same 60-ton hydraulic jacks had previously been used to apply the prestress force.

Due to the unique nature of the construction operation, Jacobsen took out special installation risk insurance. Thus, the contractor has been protected against damage to the girders or the roof slabs during construction. The insurance has a deductible clause; so only major damage is covered and not chipping off the corner of a slab, for instance.

Insurance was placed with Pacific Employers Insurance Co. of Los Angeles, which is handling Jacobsen's workmen's compensation insurance. Pacific Employers in turn placed the risk with Lloyd's of London. Premium rate is about 1% of value, with the girders valued at about $8,000 each and the roof slabs at about $400 each.

• **Hangar design**—Before adopting the prestressed, rigid-frame design, several alternate framing systems were investigated by the designers, as follows: (1) Laminated wood arch; (2) Laminated wood arch on concrete buttresses; (3) Structural steel truss; (4) Precast concrete three-hinged frame; (5) Precast, prestressed concrete girder, simple span; (6) Precast, prestressed concrete frame; (7) Prestressed concrete shell.

Cost analyses indicated that the structural steel truss building with a suspended ceiling would have been cheapest. But cost of the prestressed rigid frame installation with a suspended ceiling was only 1% higher. The Air Force decided that the additional cost was justified in view of the lower maintenance cost, greater fire resistance and permanence. The concrete roof structure without the suspended ceiling would have been cheaper than fire-protected steel trusses. But, according to the designers, the ceiling was considered desirable from the standpoint of air flow—an important factor in this particular building.



PRECAST ROOF SLABS were stacked near structure prior to placing. After the ribbed slabs were set, full prestress was applied.

The girders are cast, stressed and erected as simple beams. After roof load was imposed, additional stressing was accomplished to bring internal stress up to its full design value. Then the girders were joined integrally with the columns to form a rigid-frame structure.

The dead load on each girder is only 28% of the total design load for the girder. This means, that if the total prestress were applied without full dead load being on, there would be a compression overstress in the bottom of the girder. Thus, the girders were only partly prestressed before being erected. After the full dead load of the roof slabs is in position, they are to be fully stressed.

Depth of the girder varies from 6 ft 4 in. at the ends to 7 ft 6 in. at the center. After they are in place an additional 6 in. of concrete adds more depth for live loads.

The girders are T-shaped. Top flange is 3 ft 6 in. wide providing a shelf on each side of the girder on which to rest the roof slabs. Bottom of the girders is widened to a 1-ft 8-in. flange to add additional thickness to resist prestress compression and provide room for the tendons. Web thickness is 7 in., increased to 1 ft 8 in. at the supports.

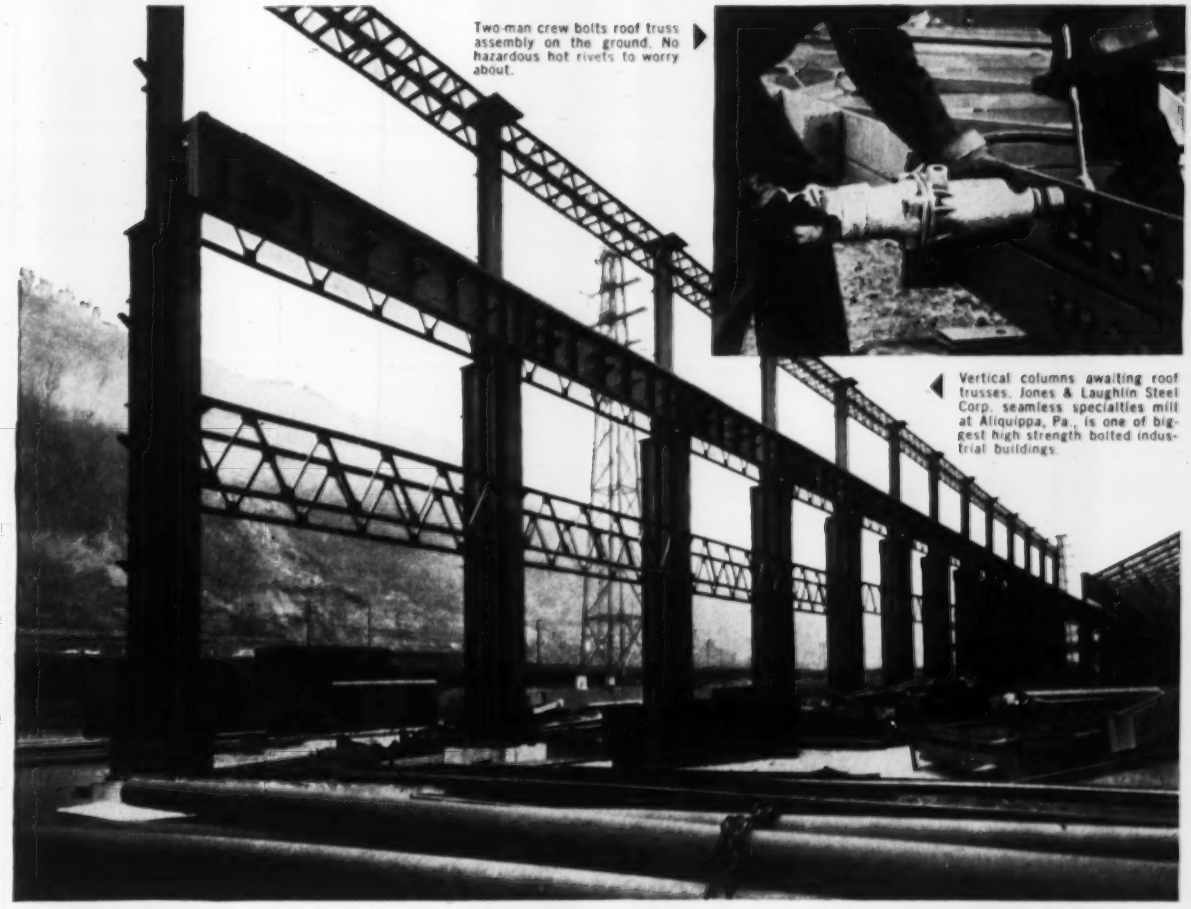
The total final prestressing force at the center of the span is 1,386 kips for typical interior girders and 1,155 kips for end girders. These forces were applied by 18 and 15 bars, respectively.

Initially, each bar is stressed to 96.6 kips and released to 92 kips. Overstress and release reduces steel creep losses. Estimated loss due to creep, concrete shrinkage by plastic flow and friction is estimated at 16%. Thus, the final estimated force in each bar is 77 kips. The partial prestress is accomplished simply by stressing only 11 bars in the 18-bar girders and 10 bars in the 15-bar girders.

Existing soil at Hill Air Force Base is subject to consolidation under load. But it reaches such depths that pile foundations are impractical. So, under the building columns a 12-ft thickness of the material was removed. Then it was replaced in 6-in. layers and compacted to 95% of modified Proctor density. This permitted construction of the building with spread footing foundations.

The hangar is a project of the San Francisco District, Corps of Engineers, Col. John A. Graf, District Engineer. Resident Engineer for all Hill AFB construction is Lawrence E. Fine. The construction is under the cognizance of Col. Edwin M. Eads, Air Force Installations Representative, South Pacific Region. The hangar was designed for the Air Force by Roberts and Schaefer Co., Chicago.

Superintendent for Jacobsen Construction Co. on the work is P. A. Maxwell. Jack Wheatley is engineer for the contractor. Laurence G. Farrant consulting on development of the erection procedure.



Two-man crew bolts roof truss assembly on the ground. No hazardous hot rivets to worry about.

Vertical columns awaiting roof trusses. Jones & Laughlin Steel Corp. seamless specialties mill at Aliquippa, Pa., is one of biggest high strength bolted industrial buildings.

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More information in Sweet's Architectural or Industrial Construction File. New Bulletin HS-1 gives quick facts on how to work with these fasteners. Write for copies for yourself and your men.

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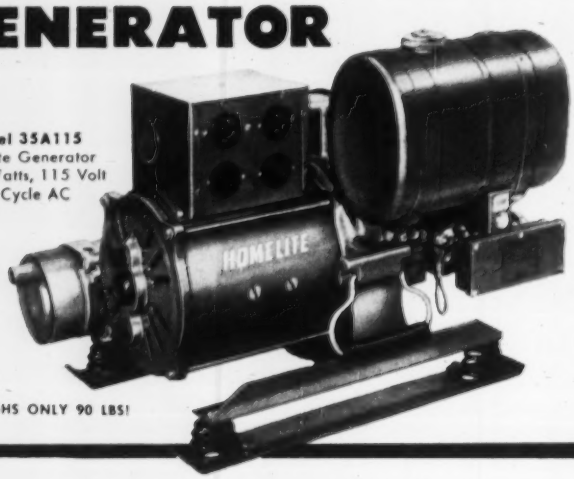

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Monorail Materials-Hauler

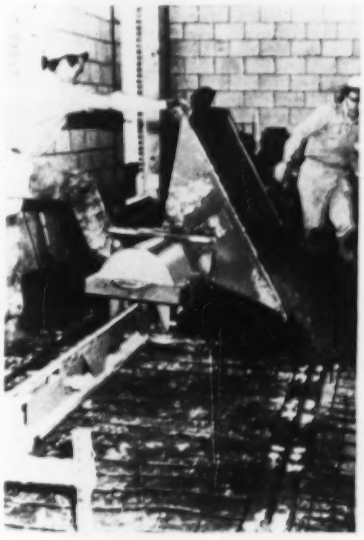
A versatile newcomer in the materials-handling segment of the construction industry, announced recently in Chicago, is a 13-cu ft self-propelled rail-type hopper car that operates on a sectionalized monorail. It is called the "Railporter."

Under tests on a variety of construction jobs in this country for the past year, the hauling unit is a modification of similar equipment which has been successfully used in Europe for a number of years.

The motorized unit is powered by a 6 hp, air-cooled gasoline engine, and, according to the manufacturer, can travel at a rate of 300 ft per minute on a level track under full load, and negotiate grades up to 10%. It has a payload capacity of 1,400 lb, which can be doubled by attaching a 13-cu ft trailer unit to the power unit.

No operator is needed to ride the unit. Instead, it is loaded at the point of supply and simply sent on its way by engaging a clutch lever. Upon reaching its destination, it stops automatically, workmen dump the hopper, engage the clutch again and the unit returns automatically to the loading point. Outboard rollers riding along the sides of the monorail keep both the power unit and trailer upright during transportation.

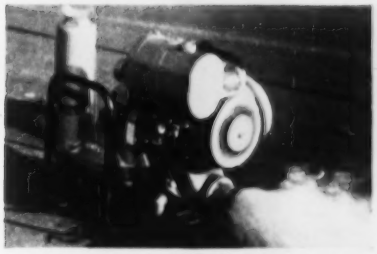
The light weight single rail on which the unit operates, comes in sections of 4, 6 or 12 ft long, supported at each joint by adjustable stands.



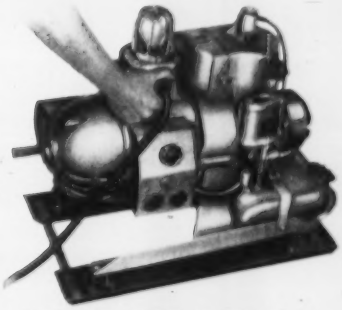
Two men, says the manufacturer, can easily set 100 ft of this track in 20 minutes; over almost any type of ground condition. A slip-pin connection joins the rail sections in seconds. Switches and curved rail are also available.

The self-propelled unit has a wide variety of applications, claims the manufacturer, in which it will save construction time and keep work on schedule. For one thing, it often eliminates the need for wooden runways

CHOOSE
from a full line of
HOMELITE
Carryable
Construction
Equipment



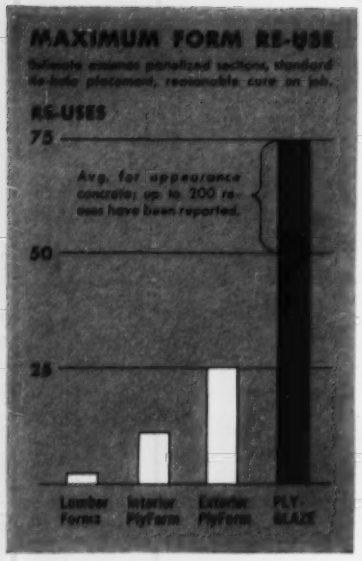
SELF-PRIMING CENTRIFUGAL AND DIAPHRAGM PUMPS
Sizes: 1½" to 3" — capacities to 15,000 g.p.h. for dewatering and water supply.



ELECTRIC GENERATOR SETS FOR TOOLS AND LIGHTS
Complete range of sizes and voltages up to 5,000 watts.

LIGHTWEIGHT POWERFUL ONE-MAN CHAIN SAWS
Complete line of saws with clearing and brushcutter attachments for every woodcutting job.

HOMELITE
A DIVISION OF TEXTRON AMERICAN, INC.
PORT CHESTER, N. Y.



50 to 75 is a good average, but with care you can get up to...

200 RE-USES with PLYGLAZE®

CONCRETE FORM PANELS

PLYGLAZE's tough, hard surface stands up indefinitely under repeated concrete pourings. PlyGlaze forms are worn out only when the panels are cut into unserviceably small pieces. With proper design and care you should get 50 to 75 re-uses. Actually, *over* 200 have been obtained—even then PlyGlaze continues to form good-looking concrete.

Another member of the famous Tree Life Family of Forest Products

Hard, glossy-smooth wear resistant fused resin-fiber surfaces.

Top-quality Exterior plywood (EXT-DFPA). Standard panel sizes.

ST. PAUL & TACOMA LUMBER CO.
Dept. ENR, Tacoma 2, Wash.
Please send free PlyGlaze literature.

Name .....

Address .....

City ..... Zone ..... State .....

and ramps. Then, too, the monorail sections, together with the adjustable supporting stands, permit the transportation system to be assembled to span excavations, reinforcing steel, flood, water or rough terrain which cannot be negotiated by conventional equipment for handling the movement of concrete or other construction materials.

The selling price of the equipment will depend upon how much is involved. But, one rough figure given by the manufacturer, places the average price at about $4,300. This covers 300 ft of monorail including some curved sections, switches and adjustable supports, a 13 cu ft power unit with trailer unit of equal size, plus one two-wheel pneumatic-tired carrier for transporting the power and trailer unit to and from the job site.

Specifications for the equipment call for the power unit and trailer unit to be all-welded steel, box type construction; and the one cylinder air-cooled gasoline engine to develop 5 hp at 2,400 rpm and 6.8 hp at 3,600 rpm. The initial drive is a detachable link V-belt drive (4 belts) while both the clutch drive and final drive are high-speed, single-strand roller chain drives. The 13-cu ft power unit measures 8 ft long, 4 ft wide and 3 ft 8 in. high. The trailer unit has the same overall dimensions and when coupled with the power unit produces a combination 18 ft 2 in. long.

The monorail is all-welded steel, and the adjustable stands vary in height from 1 ft to nearly 6 ft. When empty, the power unit, including hopper, weighs about 1,000 lb, while the trailer unit with its hopper weighs 780 lb.

According to the manufacturer, this efficient, versatile materials-handling equipment is especially adaptable to operating in narrow spaces with limited headroom such as small tunnel excavations; in pouring bridge decks of reinforced concrete; floor slabs in buildings; housing foundations and walls in muddy areas where heavy concrete handling equipment would bog down. The Railporter is not limited merely to handling concrete, says the manufacturer, it can handle just about any type of construction materials. CHAIN BELT CO., MILWAUKEE 1, WIS.

(*New Products continued on page 60*)

Tandem-Axle 6-Wheel Dodge Trucks

Dodge is now introducing a completely new line of tandem-axle 6-wheel trucks ranging from 31,000 to 46,000 lb maximum gross vehicle weight and up to 65,000 lb maximum gross combination weight.

New V-8 engines that range up to 220 hp are supplied with the new line of six-wheelers. Previously the company offered a tandem-axle 6-wheel model with 171 hp, 6-cylinder engine, and a gross vehicle weight of 40,000 lb and combination weight of 60,000 lb.

The trucks are offered with 5-speed transmissions as standard equipment and a complete line of 3-speed auxiliary transmissions available as factory installed extras. Dodge Truck Division, 2751 E. Jefferson, Detroit 7, Mich.

At 3 P.M. CAVE-IN!

Cave-ins will happen, and through no fault of the contractor. On this excavation job there was erratic soil behavior, shifting loads, rain saturating . . . everything unpredictable.

When the cave-in happened — L. B. Foster Company was called at 3 o'clock in the afternoon for rental steel-sheet piling *in a rush*. We cut the needed lengths of MP-116 piling in our yard, loaded it on Foster trucks, and made delivery on the job site 400 miles away before the crews were on the job the next morning.

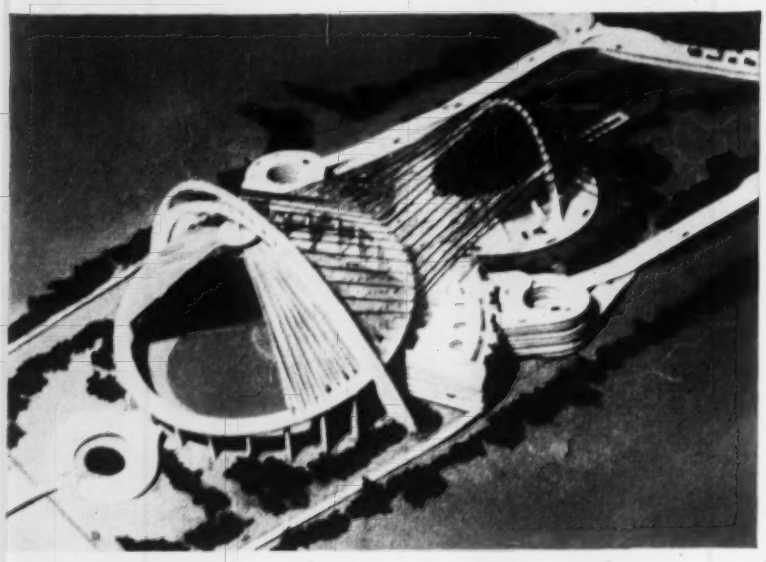
This is typical of the dependable help contractors all over the country can expect . . . and are getting . . . when they use the Foster Piling Rental Plan. Always the exact length and exact section . . . when you need it . . . on low fixed cost. Call or write your nearest Foster office for quotations on your temporary piling needs. Find out for yourself the real savings in renting from Foster.

L. B. FOSTER CO. PITTSBURGH 30, NEW YORK 7, CHICAGO 4, HOUSTON 2, ATLANTA 8, LOS ANGELES 5

"FASTER FROM FOSTER"

Steel Sheet Piling, Pipe for Piling, H-Bearing Pile, Lightweight Piling — Rails, Pipe & Fabrication

MARS outstanding design **SERIES**



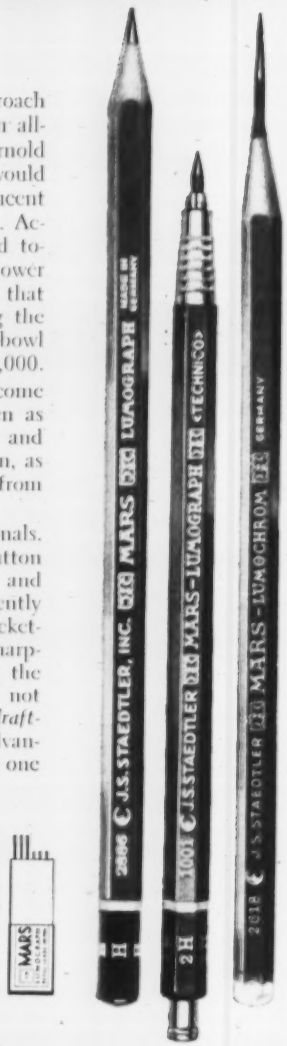
umbrella'd stadia

While it isn't always true, an interesting approach often results in a good design, as in these twin all-weather stadia designed by Harry Barone and Arnold Horn, Pratt architecture students. Each bowl would be umbrella'd by its own tentlike roof of translucent plastic, hung from the center of soaring arches. Accordion-pleated, these roofs are planned to fold together out of the way in fair weather, their lower edges riding along the rims of the bowls. Cables that guy the arches form a decorative pattern tying the two stadia together. The big football-baseball bowl would hold 65,000 spectators; the smaller, 20,000.

No matter which of today's bright ideas become tomorrow's reality, it will be as important then as it is now to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.

The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored drafting pencil, 24 colors.



J.S. STAEDTLER, INC.
HACKENSACK, NEW JERSEY

at all good engineering and drawing material suppliers

. . . New Products

New Mercury Vapor Lamps Have Increased Light Output

The new silver-white mercury vapor lamp, as well as a new golden mercury lamp, will provide improved industrial lighting, a higher degree of safety for night drivers on the nation's highways and better illumination for residential and business streets, according to the manufacturer.

The silver-white lamp produces from 10 to 20% more light than standard mercury vapor lamps. Sylvania engineers also point out that this marks the first time the industry has produced a color-corrected mercury vapor lamp that gives more, rather than less, illumination than clear mercury vapor lamps. SYLVANIA ELECTRIC PRODUCTS INC., 1740 BROADWAY, NEW YORK 19, N. Y.

New ¾-yd Excavator— For Production Efficiency

A new excavator in the ¾ cu yd class has a rated lift capacity of 25 tons on truck chassis and 15 tons on crawler mounting.

The manufacturer states that all safety and wear-resisting features of larger excavators are embodied in the machine, Model 305, including self-cleaning crawlers, automatic traction brakes, newly designed cab and operating lever arrangement and a mechanical cam-type booster clutch on the main drum clutches.

Ease of operation and reduced maintenance costs, plus an increase to 20 ft in digging depth, is claimed by the manufacturer. KOEHRING CO., MILWAUKEE 16, WIS.

Tough Concrete-Floor Paint Goes on Fast, Dries Fast

Said to be non-inflammable, free from paint odor and not affected by gasoline, oil or kerosene, Luminall Concrete Floor Paint, for indoor and outdoor use, requires no mixing, primers or sealers. It dries in only 20 to 40 minutes.

The paint can be applied by a long-handled floor brush and has a coverage of 300 to 600 sq ft per gal. It is available in six colors: cocoa brown, tile red, light gray, battleship gray, tile green, and sandstone, plus black and white.

The manufacturer claims the paint is alkali-resistant and has high toughness and surface-grip properties because it contains acrylpolyrene. LUMINALL PAINTS DIVISION, NATIONAL CHEMICAL & MANUFACTURING CO., 3617 S. MAY ST., CHICAGO 9, ILL.

Production Boom Putting on Pressure for Greater Drafting Room Output?

Now IS THE TIME TO ACT *in Behalf of Your Company and Yourself!*

Chances are that your company, like most, is gearing up for greater-than-ever production. That means more and more pressure on your drafting department for engineering drawings and prints. You owe it to your company and yourself to equip your department, right now, to meet growing demands with greater output!

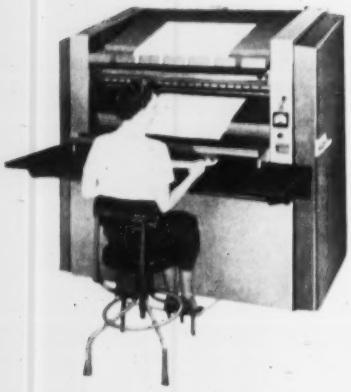
New, higher-production equipment and materials can help you do it! Never has there been a better opportunity to replace old, inadequate equipment with the efficient new products you've been wanting. With management's desire for greater production, you couldn't pick a better time to get approval for new equipment expenditures.

To discover for yourself how many ways you can boost drafting room output, yet save time and manpower, take a minute to look over the next three pages. You'll be glad you did!

BRUNING

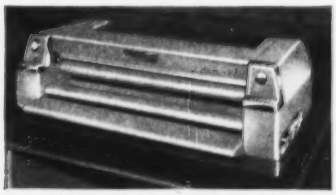
Look How Many Ways You Save Time and Money With

Check the Places in Your Drafting Room Where Production Bottlenecks Can be Eliminated by Modern Bruning Products!



1 Modern Copyflex Machines Speed Reproduction, Cut Operating Costs

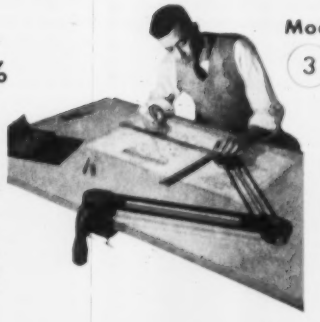
Five new and advanced machine models introduced in just the last year! They offer you all the benefits of diazo black-on-white reproduction, plus problem-free installation and operation. No fumes, no exhaust ducts. They bring you faster reproduction speed and a host of operator conveniences such as fast return of originals, automatic separation, front or rear delivery. There's a Copyflex model to meet every need. New, better Copyflex sensitized materials work together with Copyflex machines to give you premium results.



JUST OUT! New Tabletop Model 300 with 30-inch printing width! Now the smallest engineering department can afford the advantages of "inside" reproduction with low-cost Model 300. The largest company can economically supplement its reproduction center with additional, strategically located Model 300s.

2 Modern Bruning Drafters Speed Drafting up to 30%

Over conventional equipment, Bruning drafters speed drafting up to 30% on most jobs . . . up to 40% on some structural drawings. Patented "Equipoise" gravity compensator, exclusive touch control indexing provide unrivalled simplicity, precision, and ease of operation. Full range of models including Counterbalanced and Track Drafters. Standard or Civil Engineer protractor heads.



Modern Bruning Tracing Mediums 3 Speed Drawings, Enable Sharper Prints

These improved drawing mediums are unsurpassed for translucency, pencil-and-ink taking qualities, and permanence. You make drawings and tracings far easier and faster, get cleaner and sharper prints. Select from a complete variety.

Can Boost Drafting Room Output, New, Modern Bruning Products!

Why Let Old and Inadequate Equipment and Materials Stall Operations Now, When More and More Output Is Demanded of Your Department? Every Day You Delay Is Costing You Time and Money!

Here are the modern, higher-production products — some the newest on the market — that can help you boost drafting room output by replacing old and inadequate equipment and materials. A pioneer researcher in its field, Bruning still leads the way today with such developments as newly improved tracing papers and cloths that are setting a new standard in their field . . . newly improved sensitized materials that give you quality reproduction never before attainable . . . new, improved Copyflex machines that set a new high in quality, convenience, and economy of reproduction.

Researcher, manufacturer, and supplier . . . Bruning provides you a single, convenient, dependable source for everything you need in top-quality drafting room supplies and service. You simplify ordering and stocking, save time and money. Companion products, like Copyflex reproduction machines and Copyflex sensitized materials, are made to work together to give you premium results.

4 Modern Hamilton Drafting Tables Provide up to 50% More Use of Floor Space

You can put six Hamilton Auto-Shift tables where you now have four boards with separate reference desks. The unique design of Auto-Shift increases the efficiency of draftsmen, reduces waste motion and fatigue. Bruning has a modern drafting table to suit every need and budget.

5 Modern Hamilton UnitSystem Files Save Time, Space; Permit Orderly Expansion

You choose the individual filing units you need and combine them in an integrated and interlocking stack. You save time because drawings are easier to file and find. You make the most efficient use of space, expand your filing set-up in an orderly fashion.

More Products from Bruning to Help You Step up Production, Save Time and Money!

Modern Drafting Tools and Supplies Help Speed Draftsmen's Work

Bruning's wide selection includes not only standard items, but many special time-saving aids such as dotting pens, proportional dividers, planimeters, and Wrico lettering sets.

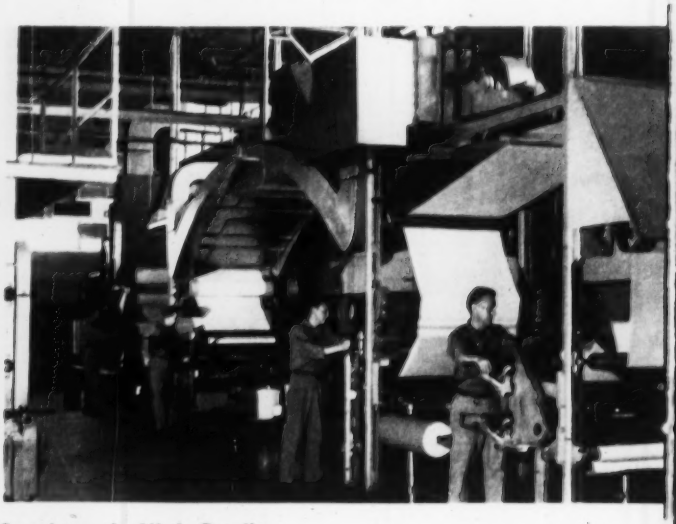
Modern Bruning Erasing Machines Save Hours of Manual Erasing

Do a neater, safer erasing job. Save hours of finger-cramping manual erasing. Patented hollow shaft permits use of extra-long, seven-inch eraser, prevents "fly-outs." Quiet, cool, vibration-free.

BRUNING *Gives You More to Help Boost Output*

3 More Reasons

Why You Can Depend on Bruning to Help You Boost Drafting Room Output, Save Time and Money!



New and Better Products —from Bruning Research and Engineering

In the past, it was Bruning Research and Engineering that introduced the first pencil tracing cloths, the first fume-free whiteprinters in America, the first band-type drafting machines. Today, by virtue of its modern laboratories and large engineering staffs, Bruning still leads the way in the development of new and better products. In just the past year, Bruning introduced five new, advanced reproduction machines . . . many newly improved tracing materials.

Consistently High Quality —from Bruning Manufacturing

In its own modern paper converting plants at Teterboro, N. J., Chicago, Kansas City, Los Angeles, and Toronto, Ontario, Bruning controls quality all the way to bring you tracing mediums and sensitized materials of dependable, consistent high quality. The famous Copyflex reproduction machines are entirely Bruning manufactured to provide you the finest in reproduction performance.

The Product and Help You Need When You Need Them—from Bruning Sales Service

With the most comprehensive network of sales-service branches, distributors, and plants in its field, Bruning assures you of prompt, dependable service and supply. Your nearby Bruning branch is headquarters for a capable staff of Bruning sales-service specialists who are immediately available to you. Your nearby Bruning branch or distributor carries a full line of Bruning products and is staffed and equipped to give you fast, efficient supply. You suffer no costly delays for lack of supply or service.

America's Leading Supplier of
Engineering and Drafting Equipment

BRUNING

There you have it—the "big package" from Bruning to help you meet the demand for greater drafting room output! You get a complete line of modern, high quality products! You get better service. They work together to bring you better results at lower cost.

Charles Bruning Company, Incorporated
4700 Montrose Avenue, Chicago 41, Illinois
In Canada: Charles Bruning Company (Canada) Ltd.
105 Church Street, Toronto 1, Ont.

Printed in U.S.A.

Publications

Production at lower cost—A 15-page booklet, "Lets Talk Tractors", features the D6, D4 and D2 tractors. It illustrates such topics as how to multiply the work power of a tractor, how to cut operating costs, and how to keep machinery young. Copies are available in English, Spanish, French and Portuguese. CATERPILLAR TRACTOR CO., PEORIA, Ill.

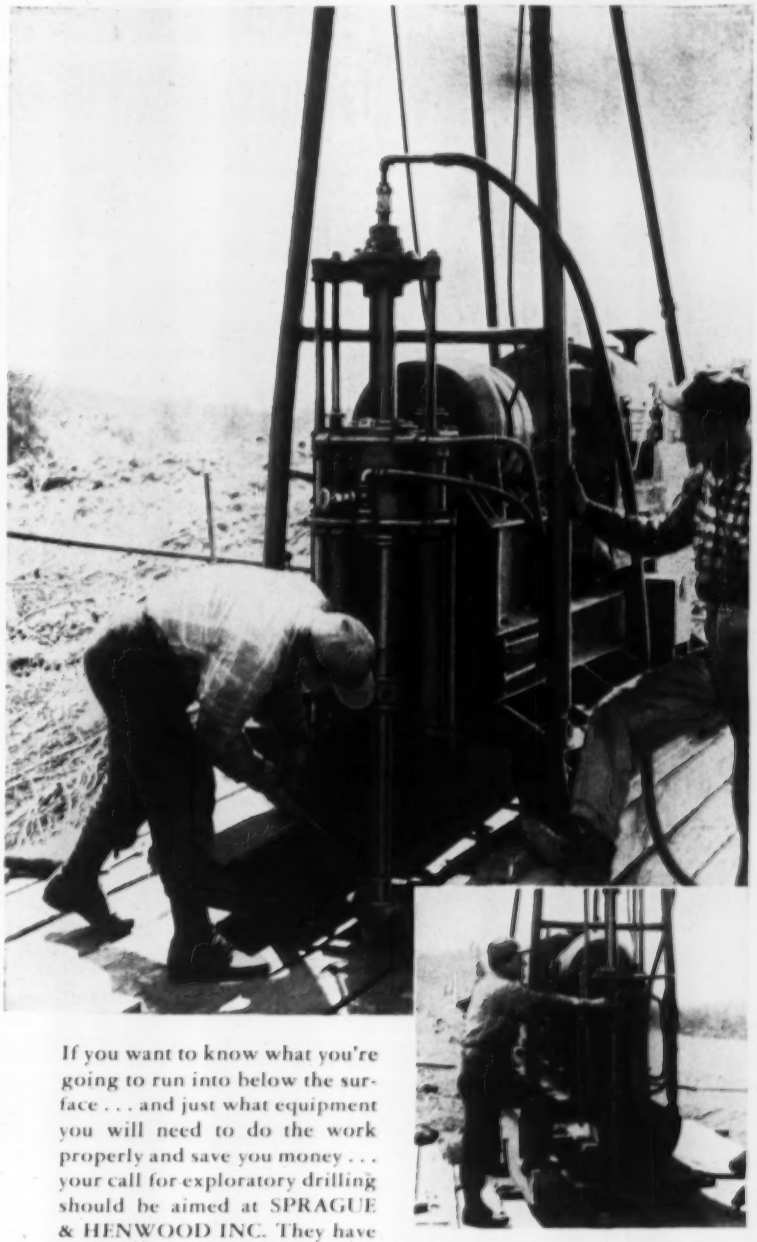
Mechanical and operational data—Catalog A gives full details and specifications on DragScraper machines plus job photos and typical layouts. The 29-page catalog describes rapid-shifting DragScrapers in sizes from ¼ to 5-cu yd and covers standard installations from ¼ to 3 cu yd. SAUERMAN BROS., INC., 632 S. 28TH AVE., BELLWOOD, ILL.

Copper tubing for drains—When copper tube was first introduced for soil, waste and vent lines, it was felt necessary to use wall thicknesses equal to those commonly used for water lines under pressure. Later research has developed a thinner walled tube called Copper Drainage Tube DWV, especially designed for drainage, waste and vent lines. The new tube's light weight makes it well suited for prefabrication. The story of this new series of tube is told in an illustrated 7-page booklet that describes the installation of the tubing in homes, gives a table of standard sizes and weights of tube available, tells about fittings and installation for residences, underground drainage lines and tall buildings. COPPER & BRASS RESEARCH ASSN., 420 LEXINGTON 17, N. Y.

Light-gage steel—Detailers and designers using Stran-Steel products should find invaluable a 24-page booklet that gives photos of installations, dimensions, details, specifications, design data, and properties of the many Stran-Steel products. The booklet breaks down in four sections: joists, studs, channels; columns and beams; ribbed decking; metal curtain wall panels. Sample calculations are shown in addition to the comprehensive design and property tables. STRAN-STEEL CORP., DETROIT 29, MICH.

Which truck to use—"Movalls or End-Dump Trucks?" is the title of a 4-page folder. The folder compares end-dump trucks and positive ejection movalls on eleven different points and is liberally illustrated with action photos. C & D DIVISION, YUBA MANUFACTURING CO., PERKINS, CALIF.

YOU'LL KNOW WHAT'S THERE
...BEFORE YOU KNOW IT...



If you want to know what you're going to run into below the surface . . . and just what equipment you will need to do the work properly and save you money . . . your call for exploratory drilling should be aimed at SPRAGUE & HENWOOD INC. They have a wealth of experience and modern equipment ready to serve you. Well-trained personnel, adequate supervision and the latest in machinery, all tend to assure you the results you are looking for.

Don't just build without foundation investigation . . . find out what's down there, first . . . and let SPRAGUE & HENWOOD find it out for you . . . You'll know what's there, before you know it.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH
BUCHANS, NEWFOUNDLAND • GRAND JUNCTION, COLORADO

Nylon cord tires reduced off-the-road tire failures...

NOW NYLON CUTS TRUCK TIRE COSTS, TOO

FRED ALDRICH, Truck Supt. Sam Braen's Sons, Hawthorne, N. J., reports:

"Two years ago we started using nylon cord tires on our off-the-road equipment. They stood up under the roughest kind of quarry work, made tire failures rare.

"That convinced us nylon cord tires had something extra, so we put them on our trucks, too. It's paid off, because we get far fewer failures, more miles per dollar.

Forming an All-Nylon Fleet

"We're sold on nylon cords. Half of our 400 pieces of equipment are on nylon now, and we specify nylon cord tires for all replacements and new equipment."

PROVE TO YOURSELF that nylon cord truck tires give more mileage, more retreads—lowest cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes the tough nylon yarns, does not produce tires.)

DU PONT NYLON for TIRE CORD

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ...THROUGH CHEMISTRY

NOW . . . IN PASSENGER-CAR TIRES, TOO . . . THE STRENGTH OF NYLON . . . FOR UTMOST SAFETY . . . SUREST PROTECTION AGAINST TIRE TROUBLE

New Terminal Is Egypt's Jet Age Bid

Egypt's civil aviation department will begin construction of a $3-million air terminal in January, 1957, at Cairo International Airport, northeast of the Egyptian capital. Bids will be invited in November. Construction is expected to go to local contractors. Date of completion has been set for January, 1959.

The new terminal will replace the present structure, which is a leftover from World War II days when the U. S. Air Force constructed the desert airfield in record time and named it Payne Field. The new structure will bring the airport closer to Cairo by several miles since it is located on the Cairo side of the field, whereas the old terminal was located on the side away from the city.

Within the new terminal, all essential services for the passengers will be provided on one level. Speedy traffic for inbound and outbound travellers has been assured by designing into the building straight-line routing from the street entrance to the airplanes, past airline counters, passport and customs offices, and waiting lounges.

There will be no crisscrossing of arriving and departing passengers. They will be processed entirely independent of each other. Even separate waiting rooms will be provided for visitors for departing and arriving passengers.

Total floor space will be 582,000 sq ft, of which 161,000 sq ft will be for public halls, concourse, waiting rooms, customs and restaurants; 172,500 sq ft will be for offices; 10,000 sq ft for sub-surface space (which will include an underground kitchen for all catering services); and 140,000 sq ft for observation terraces.

A 115-ft control tower will top a 7-story office structure that will house a hotel, plus company offices, a nursery, civil aviation department, and airport administration and communications.

Besides the below-level catering services, under ground will be freight, mail, air-conditioning units and central heating.

A multilane superhighway has already been constructed to the site of the new building. Plans are under way to link the terminal to Cairo with a fast electric railway.

Egypt is aiming the new facility at the jet age. A new runway, 9,400 ft long, has been completed. A German firm is currently constructing approach lights, as well as high intensity runway lights. Two existing runways —7,100 and 5,800 ft—are being widened and strengthened. These will be lengthened next year.

The design for the new terminal was selected by a panel of Egyptian and international architects, including Edward K. Tuttle of the U. S. The design chosen from the 14 submitted was that of young Egyptian architects Mustafa Shawky and Salah Zeitoon—both have their masters' degrees in architecture from the University of Illinois. The two also designed Cairo's tallest office building.

(*International continued on page 68*)

When bridge designs can be simplified...

Have better appearance ..require less maintenance...

Yet cost less to build...

WHY

shouldn't you design more for welding

Ask

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

Pioneer in Welded Structural Design for Lower Cost

To Specify accurate sizing control specify.. GILSON!

The GILSON Mechanical Testing Screen is *fast, accurate, and convenient* for size-testing crushed stone, gravel, slag, coal, ores, and similar materials.

When you specify GILSON Testing, you *cut out guesswork and error* in meeting sizing requirements — *prevent costly foul-ups* and delays on the job.

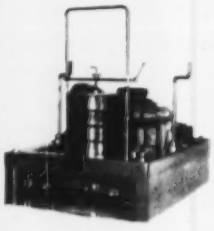
The GILSON Screen handles up to one cubic foot of sample — makes two to seven separations simultaneously, *in five minutes or less.*

About GILSON Maintenance — 87.1% of GILSON owners report little or no maintenance for at least three years of hard service! (Some up to *fourteen* years.)

Here's why GILSON is your answer:

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

A sand attachment for handling 8-inch sieves is optional equipment.



For research projects, too — the GILSON Screen is the answer to moderate-scale mass separation jobs.

What are your requirements? Write for information and quotation.

GILSON SCREEN CO. MALINTA, OHIO

. . . International

Congo Construction

Industrial boom creates demand for new airports

To meet demands of mushrooming industrial and hydropower plants—and the needs of national defense—the Belgian Congo has given a top priority to improvement of transportation facilities.

At the top of the transportation list is a series of new airports and expansion of present fields. And among the projects attracting the most interest today are those at Kitona, Leopoldville and Kamina:

Leopoldville—A new civilian field is under construction with facilities to handle military installations if necessary. The project will have two runways in a line, forming one long runway nearly five miles long.

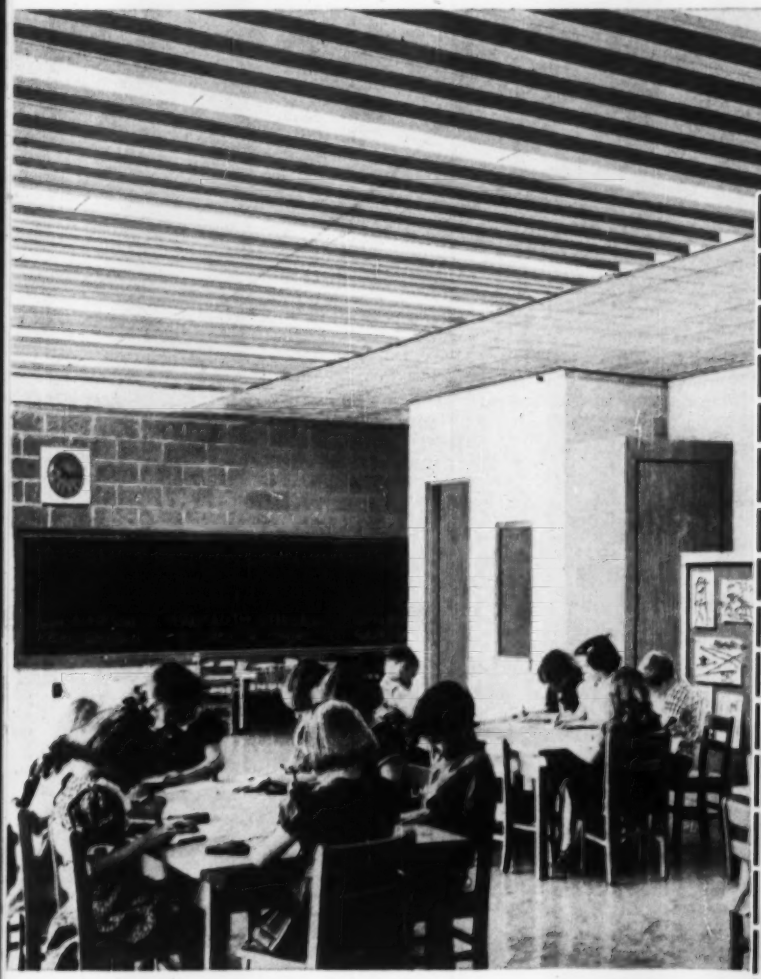
Kamina—This military base, which now takes civilian airliners on its 2.3-mi north runways, is undergoing expansion that will include a runway to the south. Total cost, including construction of military quarters, will run around $50 million.

Kitona—A 2,400-ft runway already is laid out for this military field and the area is being cleared for a 1,000-ft extension. Several more runways are in the blueprint stage and are expected to be completed by the end of next year. Accommodations for a military personnel of 2,000 also are under construction. Total cost of the work is expected to exceed $10 million.

• **Contractors problems**—One of the major drawbacks to Congo Airport construction still is labor. Builders are finding it difficult to keep good workers on the spot. And most of them have to be carefully supervised and can't be depended upon to take care of complicated equipment. In addition, the government is in the midst of raising the workers status, and this not only makes payrolls higher than ever but calls for contractors to provide free housing and medical service. Some builders think that the rising costs of native labor will force them to import all construction crews.

Runway surfacing is another headache holding up airport builders. Poor transportation facilities make it difficult to bring in adequate cement supplies. In most cases contractors are relying on a cement made of local clay and gravels, and this calls for considerable research at each work site. The main problem has been to find surfacing material that will stand

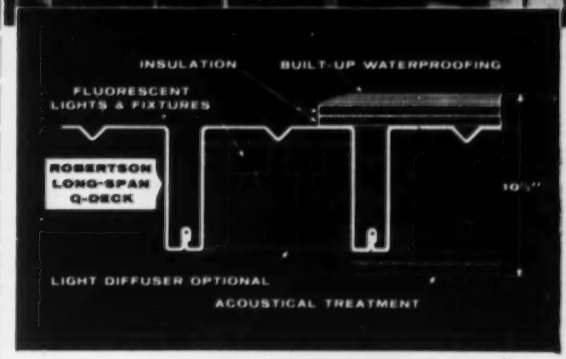
Robertson Long Span Q-Deck
cuts cost 3 ways in School Construction



1 Extra-strong Long Span Q-Deck is an ideal material for use in "reduced budget" school construction because it saves time and basic materials. Spans up to 32 feet completely cover classrooms and include corridors or outside cantilevered walkways thus reducing labor and structural steel.

2 Long Span Q-Deck used as a ceiling possesses a measure of acoustical benefit, therefore only perimeter treatment of acoustical material becomes necessary as seen in the photograph. This again saves time and material.

3 Flush lighting can be installed within the cells of Long Span Q-Deck to produce an extremely attractive, efficient, low-cost lighting system, as shown in the photograph and detail to the right. Use the coupon to write for further details on this remarkable deck — designed for multiple, money-saving benefits.



With this 3-way system, only 10½" of depth is required for the entire roof and ceiling section.

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FOR REMOTE CONTROL JOBS on a great variety of CONSTRUCTION EQUIPMENT

TRU-LAY *Flexible* *PUSH*-PULLS

• Adaptability to all sorts of mechanical situations explains, in large measure, the wide-spread use of TRU-LAY PUSH-PULLS on tractors and their accessories, power shovels, winches, road graders, road oilers, dump trucks, snow plows, engine-driven pumps, rock crushers, etc.

On construction equipment these dependable Push-Pulls are used for the remote control of hydraulic and air valves, brakes, clutches, transmissions, throttles, chokes, governors, power take-offs, and on many other applications.

TRU-LAY PUSH-PULLS are precision products, not gadgets. They provide positive remote-action whether anchorages are fixed or movable . . . for light loads or loads up to 1,000 lbs. . . . and they are effective over short or long distances up to 150 feet or more.

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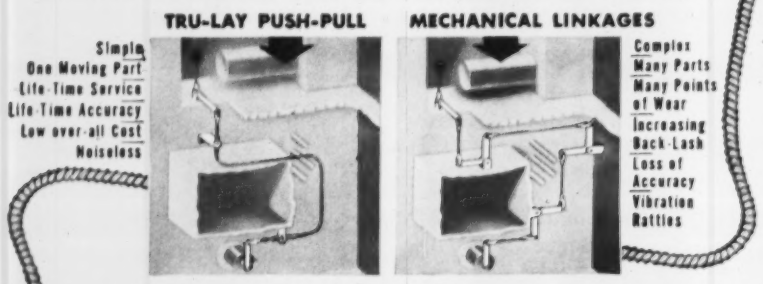
For complete information and details, write for DATA FILE.

"**Solid as a rod but *flexible* as a wire rope**" is a good description of TRU-LAY PUSH-PULL REMOTE CONTROLS. This flexibility makes it possible to snake around obstructions . . . permits the ideal arrangement of all control elements . . . greatly simplifies installation of controls by reducing the number of working parts . . . damps out noise and vibration. Versatile, accurate, adaptable, rugged . . . they are the ideal remote controls for construction equipment.

Advantages of Tru-Lay Push-Pull flexibility and simplicity are pictured below—



TRU-LAY *flexible* PUSH-PULLS are dependable and accurate even under the most adverse conditions. They perform effectively under extremes of heat or cold . . . from jet engine temperatures to 70° below zero F. The inner, working member (lubricated for life during assembly) is fully protected by the tough, flexible conduit. Abrasive dusts, dirt and moisture are sealed out. Fittings are cold-swaged to make them integral parts of the control unit. It is a matter of record that we have never heard of a TRU-LAY *flexible* PUSH-PULL wearing out in normal service. Use of these versatile, simple and rugged controls means the virtual elimination of maintenance.

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up to tropical rainfalls. Water on the clay produces a slippery surface, and in some spots inadequate drainage has caused dampened clay to swell and throw up gravel to form a treacherous runway with many weak spots. At Leopoldville, for example, drainage difficulties caused by imperect liaison between the compacted subsoil and surfacing material led to a three-month work halt and forced contractors to add $160,000 to their fee.

Keeping back the jungle is another menace builders have to deal with. At the new Kindu Airport workers have had to fell more than 5,000 trees with a one to two foot thickness to make the strip large enough for four-engine planes. The water problem there is being coped with by laying the clay cement on a couch of pebbles lying on the compacted subsoil. But even so, builders fear that a series of runway drains will have to be added.

Skyscraper Project

Two plans under study by Venezuelan investors

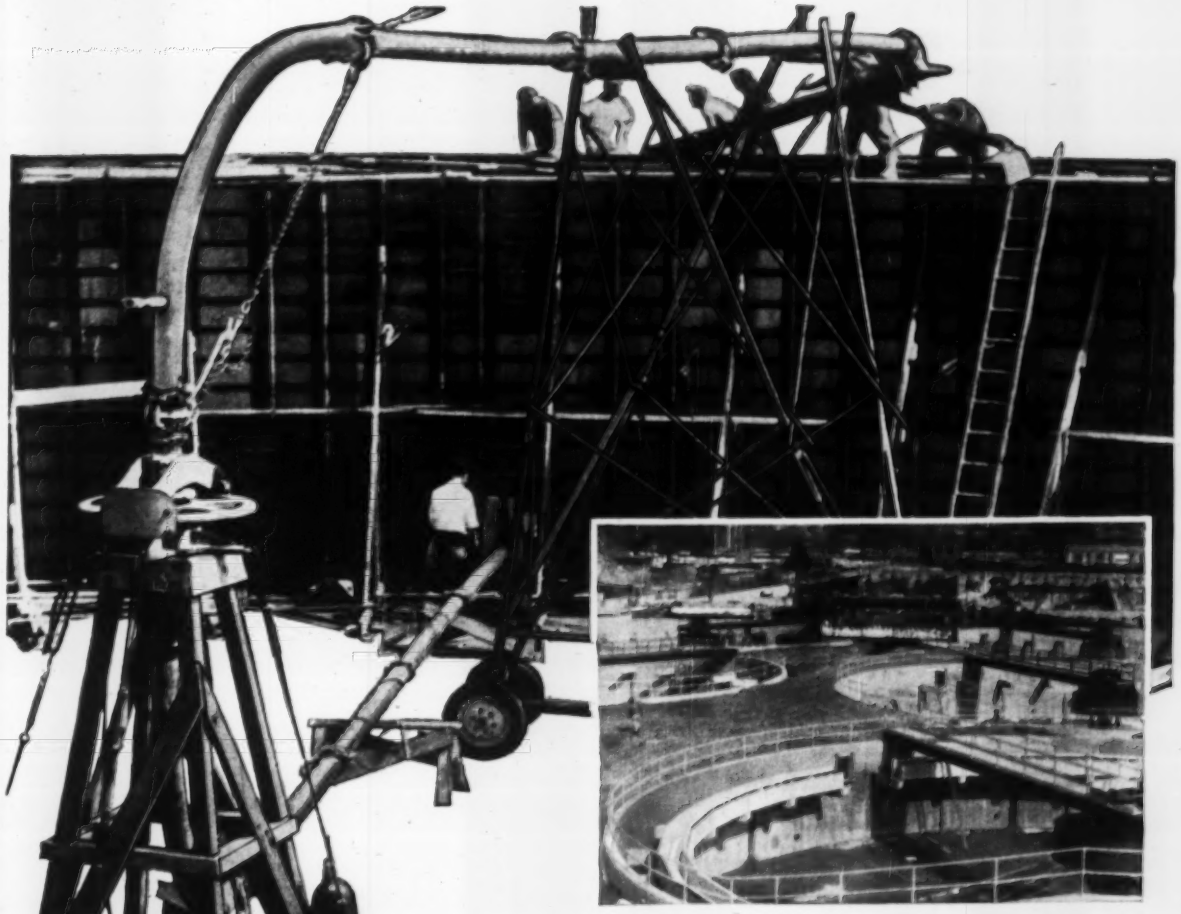
Two sets of plans for Venezuela's biggest private building project—to cost an estimated $27 million—are being given careful consideration by investors backing the project. A decision on plans is expected by the end of May, and work may begin in September. The project will take 30 months to complete.

Buildings for the project are to be erected on a square-block in downtown Caracas. The undertaking will provide up to 1,100 apartments as well as office, commercial and parking space for the more than 5,000 persons who will live and work in the area.

Prepared by architect Frank Keleman and engineer Luis G. Pulgar of Caracas, one proposal calls for a 40-story apartment building, 15- to 20-story hotel and 14-story office structure. To be steel-frame, the apartment, hotel and office structures will rise above two floors of commercial space that will cover the entire block. A park with lawns, fountain and pool will be provided on the third-floor level. There will be space for 700 apartments. Other facilities will include a school, gymnasium, library, auditorium and swimming pool.

Below ground, this scheme calls for a level of commercial and service spaces, with room for two movie theaters, and five parking levels for 1,200 cars to be reached by ramps.

(*Continued on page 72*)



Unique method of placing concrete saves time and money at Grand Rapids sewage plant

Using a special swivel pump rig to place concrete in six 100-ft. diameter settling tanks at the Grand Rapids, Mich. sewage treatment plant saved considerable time, labor and money.

As the photo shows, concrete was pumped through a rotating conduit and deposited continuously in the forms. Each tank required 180 cu. yd. of concrete and was completed in a seven-hour day by a seven-man crew.

This demonstrates concrete's adaptability to the special conditions of any job. Placed by this or another method, concrete is the ideal material for sewage treatment plants and facilities.

Concrete is moderate in first cost. It requires little or no maintenance. It has extremely long life. The result is ***low-annual-cost*** service.

For more information on concrete construction for sewage treatment plants write for a free illustrated booklet, "*Sewage Treatment Works.*" Distribution limited to the U. S. and Canada.

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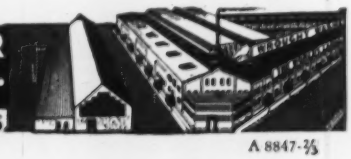


A 8847-2⅞

. . . International

According to the plan, the entire block would be protected against earthquakes by a 16.5-ft-thick layer of reinforced concrete underlaying the whole project. Total floor space provided by this scheme exceeds 1.5 million square feet.

The second plan was drawn up by architect Boby Brunori of Milan, Italy. It calls for two 40-story towers in which there will be 1,100 apartments. It provides a park on the third floor level and a medical clinic. Commercial spaces on the first two floors will be grouped in 11 sections separated by passageways open to the street. Five escalators will lead from the street floor to the mezzanine.

Underground will be two commercial and service levels, plus three parking levels for 1,200 cars served by six elevators. Total floor space for this plan is 1,700,000 square feet.

Backing the project is Instituto de Credito Hipotecario, a group of investors that put up $6 million to buy the land. German, U.S., French and Belgian groups have offered to finance construction.

Heavy-Equipment Buying Features B. C. Road Plan

To facilitate completion of its record $138-million highway construction and maintenance program for 1956 the British Columbia government has purchased over $2 million worth of truck and road equipment.

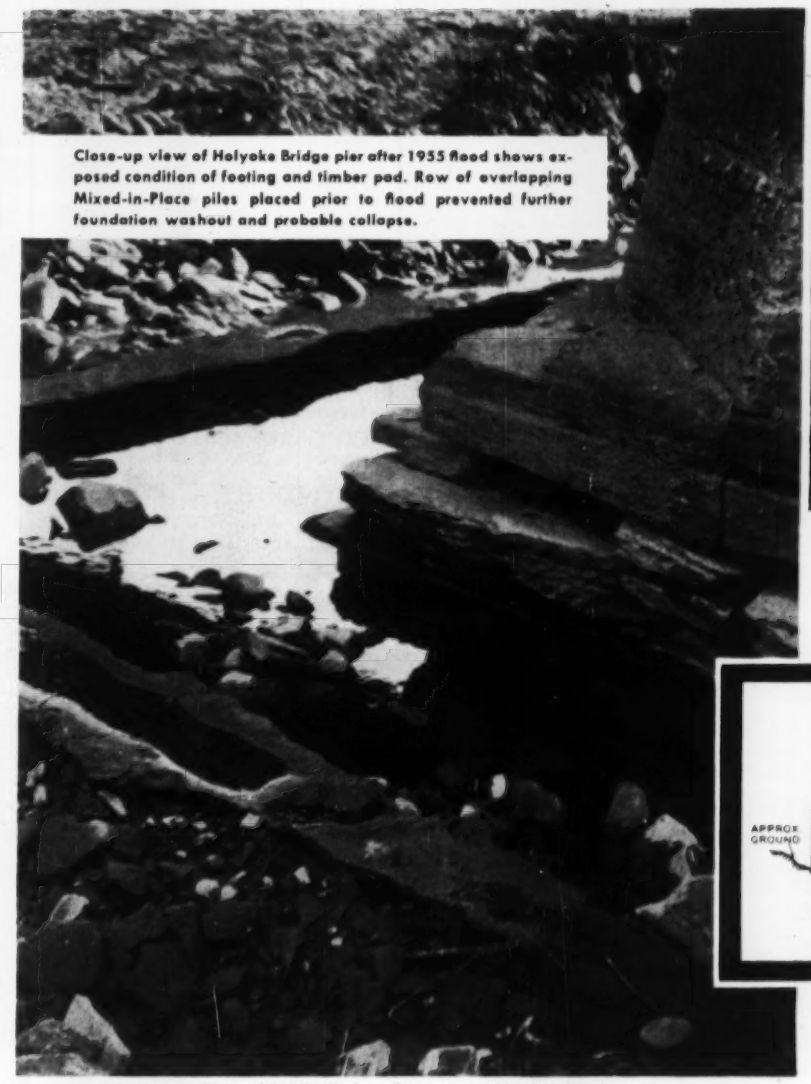
Highways Minister Philip Gaglardi said that about 200 vehicles have been bought so far, including trucks, 15 track-type tractors, 20 graders and six big scrapers. He has also recently examined asphalt mixers and layers in Chicago.

Propose $1-Billion Plan For Expressways in France

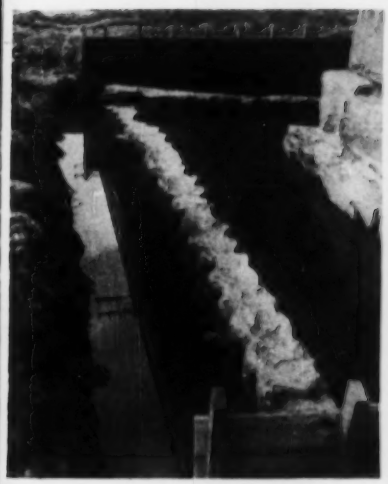
An expressway construction program estimated at nearly $1 billion is being planned by France.

The proposal would be financed by a combination of loans, tolls and credits from the National Road Investment Fund. The first section of the program is made up of 1,244 mi, including 163 mi of by-pass roads and 953 mi of main expressways. Forty-two miles of expressway now in use would be added to the system.

The newly created Commission des Autoroutes is authorized to determine the extent of roadbuilding to be done, and to control financing, land purchase, raw materials and manpower as well as coordinate administrative operations.



Close-up view of Holyoke Bridge pier after 1955 flood shows exposed condition of footing and timber pad. Row of overlapping Mixed-in-Place piles placed prior to flood prevented further foundation washout and probable collapse.



For protection against scour, piers were encircled with Mixed-in-Place piles and encased in concrete. Partially completed forms and overlapping piles are shown here.

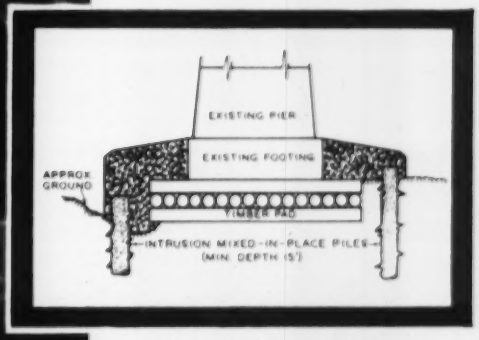


Diagram showing INTRUSION-PREPAKT repairs to Holyoke-South Hadley Bridge, Connecticut River, Massachusetts.

Owners and Engineers: Dept. of Public Works, Commonwealth of Massachusetts

Prepakt repairs save bridge during flood, now protect piers from stream scour

The Holyoke-South Hadley Bridge, its piers partially undermined, should have been an easy victim for flood waters pouring down the Connecticut River after Hurricane Diane in 1955. It was saved from collapse by Mixed-in-Place piles* which had been placed around the piers as the first phase of repair work.

This INTRUSION-PREPAKT project was undertaken to correct scour damage which had exposed and weakened six pier foundations. The PREPAKT solution was economical—overlapping Mixed-in-Place piles were placed to prevent scour and support a concrete pile cap which encases the piers. The result—piers that are stronger and more resistant to deterioration than when new.

Mixed-in-Place piles—a versatile, PREPAKT-developed technique—cost less on this job than sheet steel piling. They are made in place *without vibration* or *damage* using soil as aggregate. Equipment is highly mobile and operates in places inaccessible to pile-driving units.

To help you with your problems in the construction or maintenance of heavy concrete structures or foundations, INTRUSION-PREPAKT maintains a complete field construction organization plus an engineering service. Write: INTRUSION-PREPAKT, Inc., Room 779-L, Union Commerce Bldg., Cleveland 14, Ohio. In Canada: INTRUSION-PREPAKT, Ltd., 159 Bay St., Toronto, Ontario.

*Patents Applied For

INTRUSION-PREPAKT, INC.

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Intrusion and Prepakt are trade marks of Intrusion-Prepakt, Inc., whose methods and materials are covered by U. S. Patents Nos. 2313110, 2655024, 2434302 and others, also patents pending.

Mexico's "March to the Sea"

Ellicott Dredges aid Mexico's 30-year maritime development program

This progressive Mexican 30-year project, now in its 6th year, is depending on Ellicott for fast, economical dredging and development.

Last year, after a survey by Ellicott engineers to determine the dredging requirements, a Mexican contractor's new Ellicott Dredge began to cut an inland waterway from Tuxpan, the heart of the rich oil fields, to the booming oil refinery port of Tampico.

The Ellicott Dredge shown below, after completing the project, will continue to develop and improve other waterways and ports vital to Mexico's maritime progress.

Whatever your dredging problem, large or small, Ellicott's 70 years of experience in engineering, design, manufacture and modernization can help you. Write today for a catalog to: ELLICOTT MACHINE CORPORATION, 1603 Bush St., Baltimore 30, Maryland.

ELLICOTT DREDGES

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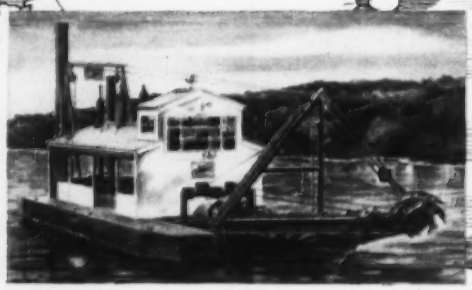

Ellicott Portable "Dragon"* model dredge shipped by rail to Mexico. Equipped with special agitating machinery, for dredging difficult material at a high output.

*T.M. Reg. U.S. Pat Off.—Marque Déposée—U.S. Pat. No. 2,731,741

map by Edwin Tunis

Planning by Plane

Engineer-pilot appraises road routes from the air

Skill as a pilot—as well as an engineer—has spiraled Charles E. Shumate to the No. 2 post in the Colorado Highway Department.

During the 30 years Shumate has been with the department he has risen from a resident engineer to administrative engineer, second in command to Chief Highway Engineer Mark U. Watrous. And in his 27 years of flying he has logged more than 5,000 hours and picked up a commercial pilot's license.

Shumate first started using a plane in highway work back in 1937. In those days he piloted an open biplane, sweeping low over proposed highway terrain to observe streams, arroyos or rock outcroppings that would interfere with economical construction. Today he flies a photographer over the routes in the department's twin-engine Piper. Strip photos—taken at 4,000 or 8,000 ft—are enlarged to a scale of 1 in.-to-100 ft and pieced together.

Since Shumate's pioneer flying days aerial photos have played an increasing role in the road department's route planning—and have saved thousands of dollars. Photographic layouts sold a whole community on an 18-mi freeway project south from Colorado Springs. They were successful in mapping out the 23-mi Denver-Boulder tollroad. And in recent months they were used to seek out possible sites for the long-discussed toll tunnel under the Continental Divide.

"By photographing highway routes we can put a line on the maps even before we go to stake it," says Shumate. "This gives a complete perspective of the area. We can shift and maneuver on paper—at little cost—to find the most desirable route. We have it all planned before the crews go into the field. And that's real savings in money and time."

Advance photographing of proposed highway routes has resulted in other important economies in planning. "By changing routes slightly we have saved many thousands of dollars in right-of-way costs," says Shumate. "In addition, aerial pictures have been responsible for providing better drainage control because more accurate calculations can be made of the drainage control areas. And the photos also are a successful tool in winning over city officials and property owners to the department's viewpoints on the best route for a highway."

Division Engineer Named By Bureau Of Public Roads

The Bureau of Public Roads has appointed Alonzo C. Taylor, division engineer for Texas, Oklahoma, Arkansas and Louisiana with headquarters in Ft. Worth. He succeeds the late J. A. Elliott.

Taylor, a 1924 graduate of Texas A&M, was once attached to the bureau's Ft. Worth office in the early 30's. Twice he has been assigned to the Philippines; the first time in 1946 as programming and planning engineer and the second, in 1951, as division engineer in charge of a $50-million construction program.

Returning to the United States in 1955 Taylor has been in the bureau's Washington office until being named to the Ft. Worth post.

Men and Jobs Briefs . . .

• **Associations**—The Asphalt Institute appoints **Robert C. Briggs** as district engineers for New England with headquarters at Boston.

• **Corps of Engineers**—The executive officer of the North Pacific division, **Col. Charles D. McDaniel,** has been appointed Inspector General for the Corps, to be stationed at Fort Belvoir, Va. effective June 1.

• **Careers**—The State of Delaware appoints **Chester V. Townsend, Jr.,** of Sandy Landing, Del., to the Delaware State Highway Commission for a six year term, succeeding **Dallas D. Culver** of Seaford, Del. . . . **Charles F. Bobst** is named superintendent of the Columbus, Ohio, Building Division.

• **Stanley T. Siegel,** formerly with the National Safety Council, Chicago, is named traffic engineer for the city of Indianapolis, Ind. He succeeds **William H. Bilby** who resigned to become a traffic engineer for the Indiana Highway Department . . . **Dean L. Morgan of Millbury,** Ohio is appointed city engineer at Fremont, Ohio, to succeed the late Charles Hochendedel.

• **Business**—The Stone & Webster Engineering Corp. announces the appointment of **Richard M. Wood** as construction manager, with headquarters at the firm's Boston office. A 1912 Johns Hopkins engineering graduate,

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★ Boiler Breechings
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First: the model you choose is the finest performer in its class – rugged in design, reliable in operation.

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NEW "STREAMLINER 400"

LOOK FOR IT!

Wood joined Stone & Webster in 1921.

• **Retirements–P. H. Daniells,** an assistant chief engineer for the Missouri State Highway Commission for more than 11 years.

Obituaries

Samuel C. Hadden, 73, who was for two terms chairman of the Indiana State Road Commission, and president of the American Association of State Highway Officials in 1944, died last week at Indianapolis.

A 1905 civil engineering graduate of the University of Illinois, Mr. Hadden taught engineering at Michigan State College for four years, and spent 16 years in engineering editorial work.

After retiring from work with the Indiana commission in 1952, Mr. Hadden established himself as a consulting engineer in Chicago.

Grover C. McGimsey, 61, city engineer at Lenoir, N. C., for 10 years, died April 30. A civil engineering graduate of the University of Tennessee, he was with the North Carolina Highway Department until 1926; then turned to private contracting and five years later rejoined the Highway Department. He was appointed city engineer at Lenoir in 1946.

Paul V. Betters, 50, well-known to engineers as an expert on municipal government, died May 11 at Silver Spring, Md. He had been executive director of the U. S. Conference of Mayors since 1932. Previously, he had served as a staff member for the Brookings Institution, at Washington.

Edward R. Bowen, 71, one of the consulting engineers who designed many of the principal structures of the Los Angeles Aqueduct, died April 18. He had been a partner in the engineering office of Lippincott & Bowen and was known principally for his work on Western water supply projects.

L. Litsey Adams, 67, chief engineer for the Louisville & Nashville Railroad since 1951, died May 4. He started his railroad career with the company as a surveyor in 1911, after graduating from the U. of Ky.

Max V. Sauer, 75, who retired in 1953, as chief engineer of the power development division of the Quebec Hydro-Electric Commission, died April 28. Since his retirement he had been alternate member of the joint board of engineers on the St. Lawrence Seaway project.

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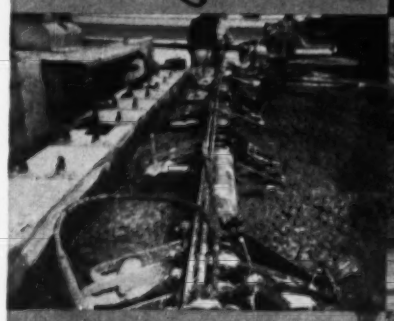
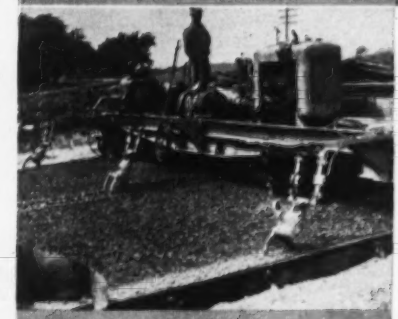


JACKSON PAVING TUBE (INTERNAL TYPE)

JACKSON MULTIPLE VIBRATORY COMPACTOR



JACKSON SIDE FORM VIBRATOR

JACKSON VIBRATORY SCREED

JACKSON POWER PLANT

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The JACKSON MULTIPLE COMPACTOR has now thoroughly demonstrated that it is by far the most advantageous equipment for achieving or exceeding specified densities in rock, slag, sand, gravel . . . all granular soils used in waterbound and penetration macadam construction, and in filling the voids in rock and slag courses with fines. The Jackson does it in about half the time required with other types of equipment. It is equally efficient for consolidating large granular soil fills such as bridge approaches and kindred projects.

JACKSON INTERNAL TYPE PAVING TUBE

Supplied with extraordinarily powerful motors, no concrete highway or airport paving job is too tough for this improved machine. Tubes vibrate deep in concrete, quickly plasticizing harsh dry mixes in slabs to 24" thick and as wide as 25'. It saves time, saves cement; provides greater density and compressive strength. Cuts spreading costs where no spreader is used. The tube is made up of one unit as shown for each 5'-0" (maximum) of slab width. Usually attached to front of finisher and controlled by finisher operator. Power is supplied by a Jackson Power Plant mounted on the parent equipment.

Use of a JACKSON Side Form Vibrator on standard finisher assures thorough consolidation and plasticity of concrete at side and center forms—with no "missed" spots. Labor savings effected quickly repay cost of equipment.

MUNICIPAL PAVING—BRIDGE DECKS, ETC.

For jobs of this type a JACKSON Vibratory Screed and Portable Power Plant is the most convenient, productive and inexpensive outfit you'll find anywhere. Strikes off to any crown, undercuts at curb and sideform, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 feet wide, and it may be rolled back for second passes on 4 rollers.

PORTABLE POWER:

Thoroughly reliable, time-proved plants in capacities of 1.5 to 7.5 KVA . . . equipped with permanent magnet generators requiring no maintenance or adjustment. They provide both single and 3-phase 120 V., 60 Cy. AC and may be used for lights as well as operating all JACKSON equipment.

FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

JACKSON VIBRATORS, INC. LUDINGTON MICHIGAN

1-day seismic survey solves subsurface problem for recreation center

Plans for the 10-acre Hayden Recreation Center in Lexington, Mass., call for a playground, main building and other structures. This is a glacial till area where bedrock varies widely and boulders are common. Exploration of the site by borings alone would have been difficult, expensive and time consuming. Stone & Webster, engineers for the site exploration, called in a Gahagan Seismic Survey Crew. They started work at 9 A.M. using portable equipment, and by 4.30 that afternoon, under ideal conditions, had completed 14 profiles of bedrock elevation each 110 feet long. Final report was submitted at 2.30 the next afternoon. Later, five test borings were put down at key construction points indicated by Gahagan's findings. Correlation between borings and seismic data was good. Stone & Webster report "results of seismic survey are most satisfactory." Write for factual Bulletin No. 1 to Geophysical Survey Division, Gahagan Dredging Corp., 90 Broad St., New York 4, N. Y.

Established in 1898, Gahagan is a leader in hydraulic dredging

ANOTHER
GAHAGAN
CASE HISTORY

Notice of CHANGE . . . . .

Kindly note the below design and fabricating firm has occupied its new suburban fabrication plant and offices. Your inquiries concerning steel forms for mass concrete construction should be addressed to:

DIXIE FORM & STEEL CO.

(Formerly Records & Stephens Co.)

P. O. Box 1997 San Antonio, Texas

Phone: TAylor 6-6347

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A COMPLETE LINE OF GUARD RAILS

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Books

Ocean Outfalls

AN INVESTIGATION OF THE EFFICIENCY OF SUBMARINE OUTFALL DISPOSAL OF SEWAGE AND SLUDGE—By Erman A. Pearson, 154 pp. State of California, State Water Pollution Control Board, Sacramento, Calif., Publication No. 14. Available from State Printing Division, Documents Section, Sacramento 14, Calif. $2. (California addresses add $0.08 sales tax)

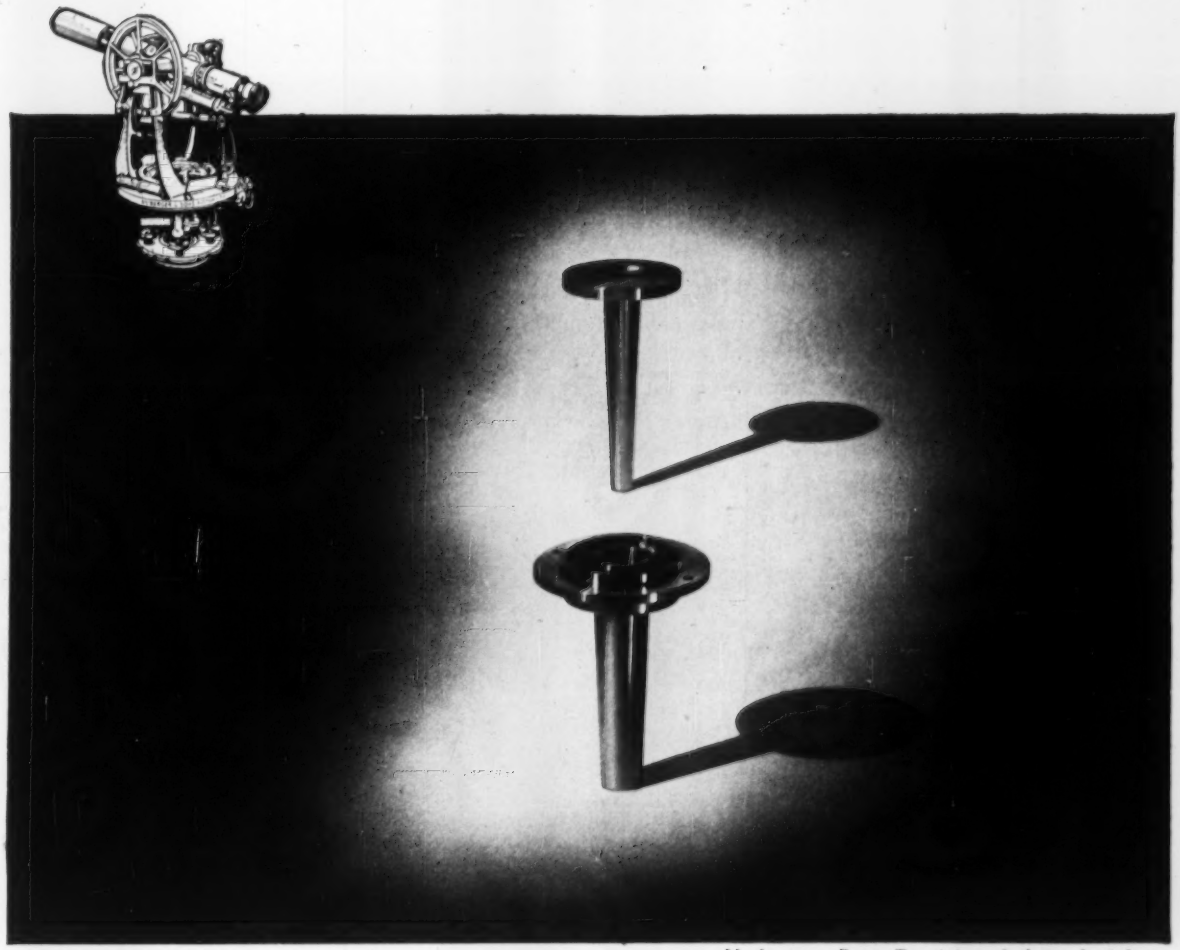
Present knowledge of ocean outfalls is summarized in this research report. Emphasis is given to outfalls on the California coast but data on other Pacific Coast outfalls as well as many Atlantic Coast outfalls are included. Design, construction, operation and maintenance are considered in some detail. And the report deals with such matters as oceanographic factors, effect on marine resources, and viability of sewage bacteria in sea water. An extensive bibliography is included.

The report was prepared for the California State Water Pollution Control Board by a consulting sanitary engineer. The board recognized the increasing need for information on technical and economic aspects of disposal through submarine outfalls. The information will aid in keeping costs to a minimum and yet it will also help in the protection of the various beneficial uses of the receiving waters. In his conclusions, Pearson recommends several specific areas where additional studies are needed. Among the areas needing more research are problems of adequate monitoring, dispersion of sewage in sea water and a critical evaluation of batting water criteria and evaluation. It is likely that additional funds will be made available—particularly since the Los Angeles situation makes thorough knowledge in this field important. Los Angeles is planning six-mile outfall discharging in 200 ft depths (ENR, Apr. 5, p. 29). And an even longer disposal line for digested sludge is contemplated.

Reports and Pamphlets

1952 EARTHQUAKES, KERN COUNTY, CALIF.—Prepared by the Structural Engineers Association of Northern California, 417 Market St., San Francisco, Calif. $3.50.

PROCEEDINGS OF THE WESTERN MUSKEG RESEARCH MEETING MARCH, 1955—Technical Memorandum No. 38. Division of Building Research, National Research Council, Ottawa, Canada.



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WE MAKE OUR CENTERS THE HARD WAY FOR GREATER ACCURACY IN READING ANGLES AND LEVELING

You'd think precision machining was all it takes to produce free-rotating transit centers, without play or wear over long service periods. But that's not the way Berger craftsmen see it!

So they gage each Center, after machining, to 50 millionths (.000050") on Berger's specially-built gages . . . then lap every one by hand to smooth away any minute rough spots. The matched-fit of the inner and repeating Center assembly assures that unvarying true center of rotation —the basis of accurate readings of angles and leveling. This is further confirmed by testing the Centers group with a level vial sensitive to 5 sec. of arc to assure that they function as a precise, integrated unit.

And that's not all: Berger Transit Centers are completely free of porosity—all bronze with inner spindle of bell metal —another reason why they revolve so freely within each other without fretting or binding under any variation of climatic condition. They're larger, too, with greater bearing contact between the inner and outer working areas.

Here is just one more of the many *extra* long-term values you can count on when you buy BERGER—as so many leading engineers do. C. L. Berger & Sons, Inc., 45 Williams Street, Boston 19, Massachusetts.

IF YOU'VE NEVER OWNED A BERGER, *you owe it to yourself to learn how accurate it really is . . . how little repair it requires . . . the lifetime of trouble-free service you can count on . . . how inexpensive a Berger Instrument is in the long run. Write for a copy of "Accuracy in Action."*

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ENGINEERING AND SURVEYING INSTRUMENTS...SINCE 1871

"AMERICAN TUBULAR"

THE NO. 1 NAME IN ELEVATING TOWERS

ALL TUBULAR MEMBERS GALVANIZED

Available with material platform and/or concrete equipment in Heavy Duty and Light Duty models.

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PUMPING PROBLEM?

Predrain with a

MORETRENCH WELLPOINT SYSTEM

Dependably enables you to dig "In the Dry." Speeds jobs — saves money.

CATALOG ON REQUEST

MORETRENCH CORPORATION

90 West St., New York 6, N. Y.
Chicago, Ill. • Tampa, Fla.
Houston, Tex. • Rockaway, N. J.

$10.5 Million Bridge for Connecticut Turnpike

The new concrete and structural steel bridge over Quinnipac River in New Haven, Connecticut, will have 26 spans. Work is for the Connecticut State Highway Department in Hartford. G. F. Pawlikowski of New Haven is consulting engineer and Newman E. Argraves is state highway commissioner.

The design calls for two contracts, one for the substructure with grading and drainage work, the other one for the superstructure with concrete deck.

With five water piers and 15 land piers and approaches the substructure extends over 4,245 ft. The 3,769-ft superstructure carries two 41-ft concrete roadways, a median, 4 ft wide and 4 ft high, and two outside safety curbs, 1½ ft wide and 10 in. high.

William M. Moore Building Corporation & Lopier Construction Corporation, New York, were low of ten bidders and got the $2,562,703 contract for the substructure.

The $7,887,754 contract for the superstructure went to Bethlehem Steel Company of New York.

Minimum wage rates for skilled labor range from $2.20 to $3.55, for intermediate grade labor from $1.85 to $2.20, and for unskilled labor from $1.00 to $1.90.

The bidders included:

Substructure, Grading & Drainage

1C	Wm. M. Moore Bldg. Corp. & Lopier Const. Corp., New York, N. Y.	$2,562,703
2	C. W. Blakeslee & Sons, Inc., New Haven, Conn	2,595,651
3	The Mariani Const. Co., New Haven	2,875,285

Bids: 1-30-56 Items	Unit	Quantity	Unit Prices 1C	2
Traffic, maint & protect	ls	job	$5,000	$10,000
Clear & grubb	ls	job	5,000	15,000
Excav, earth	cy	5,400	0 60	4 00
struct, complete excl cofferdam & pump	cy	10,800	2 00	4 00
trench, 0-6' deep	cy	18,000	5 00	4 00
0-10'	cy	900	1 00	2 00
0-15'	cy	900	1 50	3 00
0-15'	cy	1,430	2 00	11 00
0- over 15'	cy	125	2 60	11 00
Dredging	cy	18,500	2 00	1 60
Borrow	cy	4,700	1 00	1 50
RCP, 15"	lf	760	2 00	3 00
18"	lf	960	3 00	4 00
30"	lf	60	10 00	12 00
38"	lf	512	15 00	14 00
CIP, 6"	lf	200	4 00	4 00
Pipe, ACCM, 15" *	lf	370	3 00	4 50
6"	lf	80	1 00	2 00
Catch basin, type C-G	ea	1	500 00	250 00
Manhole	ea	11	400 00	250 00
over 10' deep	ea	5	900 00	300 00
reconstruct	ea	1	100 00	250 00
Pile, test, timber, 70'	ea	8	500 00	300 00
80'	ea	11	700 00	300 00
100'	ea	3	1,000	600 00
stl, 14BP 73 170'	ea	1	1,000	1,000
80'	ea	1	700 00	300 00
10BP 42 40'	ea	3	600 00	200 00
35'	ea	10	600 00	200 00
30'	ea	3	600 00	200 00
Pile loading test	ea	12	600 00	900 00
Piles, timber, 50'	f lf	5,000	0 65	0 65
55'	f lf	15,015	0 70	0 70
60'	f lf	18,870	0 80	0 75
65'	f lf	28,470	0 85	0 80
70'	f lf	10,500	0 95	0 90
75'	f lf	6,750	1 05	1 00
80'	f lf	27,280	1 20	1 15
Piles, stl	f lf	1,957,000	0 06	0 07
timber, drive	lf	106,620	0 60	0 55
splice	ea	12	50 00	50 00
stl, drive	lf	28,560	1 00	1 75
splice	ea	10	60 00	50 00
Tips, pile, reinf, stl	ea	619	100 00	50 00
Cofferdam & pumping	lf	2,012	100 00	150 00
Conc, cl A	cy	19,520	40 00	35 00
underwater	cy	9,465	20 00	25 00
Bit joint fill, ½", premoulded, for bridges	sf	60	0 25	1 00
Stone mary, dimension	cy	236	290 00	300 00
ashlar	cy	648	190 00	200 00
Steel bars, deformed	lb	1,587,300	0 13	0 11
Steel, struct	lb	50,000	0 25	0 30
Pipe leaders	lf	595	5 00	12 00
Dampproofing	sy	140	0 60	2 00
Gravel fill	cy	1,170	6 00	4 00
Bkfl, struct, pervious	cy	420	2 40	2 00
Subbase	cy	500	4 50	2 00
Subgrade, formation	sy	3,070	0 30	0 20
Broken stone for base	t	1,000	4 75	3 00
for bit macadam pave	t	520	5 00	4 00
Rolled gravel base	cy	70	4 00	3 00
Bit matl for pave	gal	9,140	0 20	0 18
Calcium chloride for dust control	t	10	60 00	90 00
Water for dust control	hr	500	2 50	5 00
Gd railg, 3-cable, remov	lf	1,000	1 20	0 50
Piles, greenheart timber, 55'	f lf	5,060	2 00	2 00
65'	f lf	6,370	2 50	2 50
greenheart fender, driv	lf	11,070	0 80	0 90
Greenheart fender timber	Mbf	83	600 00	600 00
Crossover, temporary	ls	job	2,000	500 00
Junction box, 10x10x8"	ea	10	45 00	55 00
Conduit, rigid stl, 1½"	lf	500	2 00	1 50
2½"	lf	24	3 00	3 50
Navigation lights, perm	ls	job	720 00	1,600
Retard densif for conc	lb	94,000	0 19	0 20
Trafficmen	hr	400	1 50	3 00
Const sign, series 1	ea	4	50 00	35 00
2	ea	2	50 00	70 00
6A	ea	2	130 00	35 00
6B	ea	3	140 00	60 00
Fl barricade, series 9 & 10	ea	18	300 00	50 00
Pave & appurt, restore	ls	job	1,000	2,000
Crushed stone for slope protection	t	90	5 00	4 00
Portland cement	bbl	44,552	5 00	4 40
Natural cement	bbl	4,978	4 50	4 40
Fertilize & seed, type II	sy	10,000	0 10	0 10
Liming	t	1	100 00	50 00
Mulch	sy	10,000	0 15	0 06
Disposal of buildings	ls	job	4,500	3,850

* ACCM—Asbestos Covered Corrugated Metal

Time to complete: 460 calendar days
Liquidated Damages: $1,300 per day

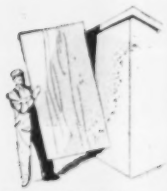
Superstructure & Concrete Deck

1C	Bethlehem Steel Co., New York, N. Y.	$7,887,754
2	American Bridge Division, United States Steel Corporation	7,989,776

Bids: 2-20-56 Items	Unit	Quantity	Unit Prices 1C	2
Traffic, maint & Protct	ls	job	$11,500	$8,000
Conc, cl A	cy	10,500	78 00	74 50
Bit joint fill, premould, ½", for bridges	sf	4,720	2 30	1 00
1"	sf	520	2 30	1 00
Steel bars, deformed	lb	2,570M	0 168	0 147
Steel, struct	lb	18,300M	0 279	0 2838
low alloy	lb	6,540M	0 279	0 2985
Bridge rail, metal	lf	7,000	8 00	10 28
Retard densif for conc	lb	47,200	0 3465	0 27
Trafficmen	hr	300	5 75	4 40
Conduit, rigid stl ¾", navig light	lf	15	1 40	1 50
1"	lf	160	2 90	2 00
1½"	lf	980	3 60	2 50
1½" roadway light	lf	20	2 65	2 50
2", navig light	lf	1,200	3 95	2 50
2", roadway light	lf	130	4 05	2 50
2½", navig light	lf	80	7 60	3 00
2½", roadway light	lf	7,500	3 05	3 00
Junction box, CI, 18x18x 10", roadway light	ea	34	275 00	300 00
8x8x8", roadway light	ea	1	51 00	100 00
sheet stl, 18x12x8", navig light	ea	17	98 00	
18x12x10"	ea	1	130 00	2,500
Navig lights, permanent	ls	job	8,590	6,600
Bridge rail, metal, 8'	lf	520	13 00	22 23
Wire fabrik, woven	sy	300	14 20	9 00
Portland cement	bbl	17,100	5 80	5 25

Time to complete: 595 calendar days
Liquidated damages: $2,100 per day

No costly re-coating between pourings

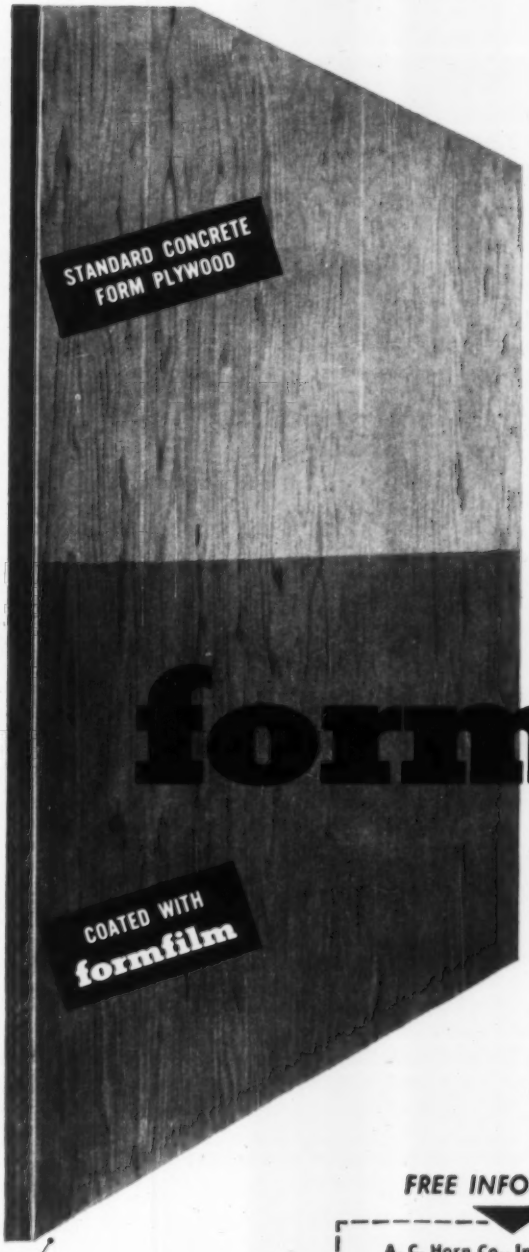


Forms strip easily

Eliminates costly rubbing of oil stain and grain marks

Leaves concrete clean, smooth . . . ready for decorating

Not an oil . . . eliminates slip hazards



How to get more than 10 re-uses from plywood forms!

Coat them with formfilm

Protect your investment in plywood forms with FORMFILM. It's a tough, abrasion-resistant, alkali- and water-resistant coating (not an oil). Eliminates raising of wood grain and reduces honeycombing.

A Subsidiary of Sun *Chemical Corporation*

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Manufacturers of materials for building maintenance and construction since 1897.

FREE INFORMATION!

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Firm Name _____

Address _____

City _____ State _____

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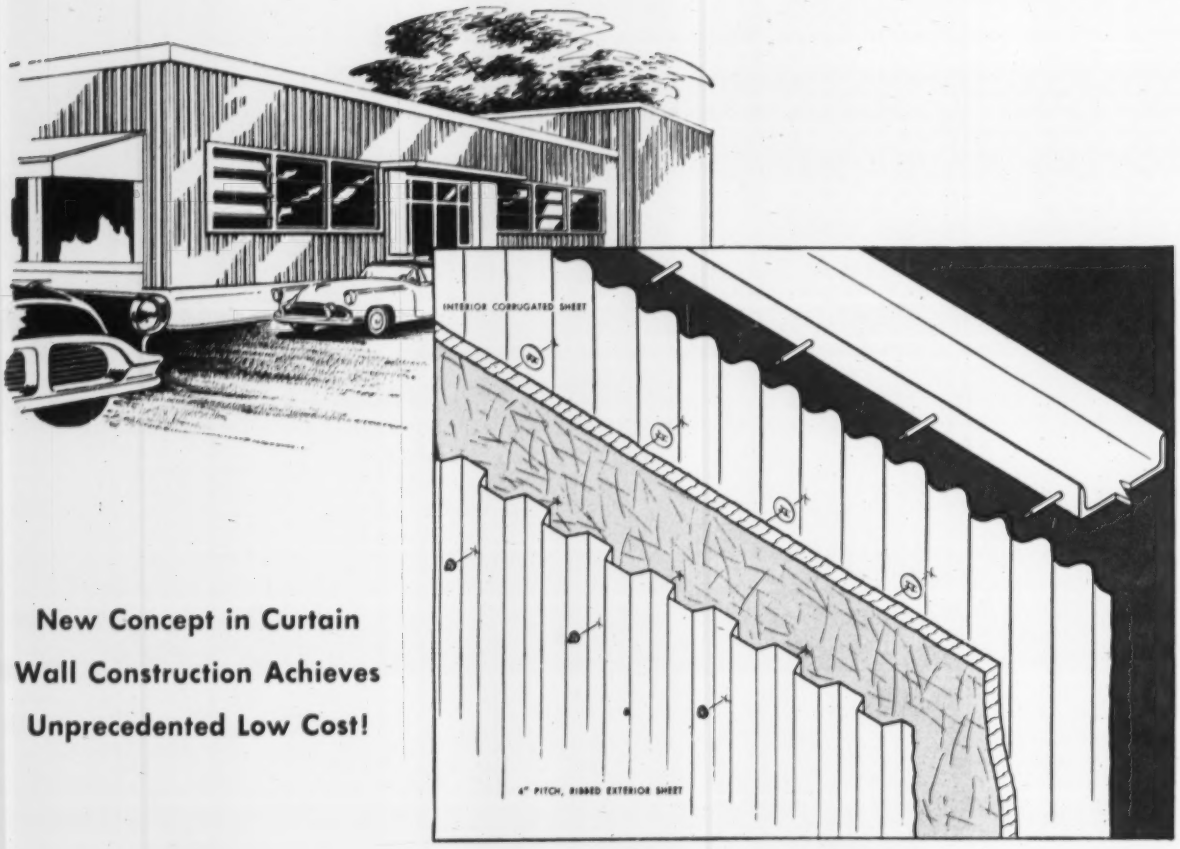
HORN • **HUDSON** • **WILLEY** (paints, maintenance and construction materials, industrial coatings) • **WARWICK** (textile and industrial chemicals) • **WARWICK WAX** (refiners of specialty waxes) • **RUTHERFORD** (lithographic equipment) • **SUN SUPPLY** (lithographic supplies) • **GENERAL PRINTING INK** (Sigmund Ullman • Fuchs & Lang • Eagle • American • Kelly • Chemical Color & Supply Inks) • **MORRILL** (news inks) **ELECTRO-TECHNICAL PRODUCTS** (coatings and plastics) **PIGMENTS DIVISION** (pigments for paints, plastics, printing inks of all kinds)



New Concept in Curtain Wall Construction Achieves Unprecedented Low Cost!

Reyconowall

Field-Assembled Insulated Curtain Wall System

Soundly engineered to combine high thermal efficiency, economical installation and freedom from maintenance, *Reyconowall* widens the horizons of industrial and commercial wall construction.

The high insulation value of *Reyconowall* (U factor as low as .155) is guaranteed by sandwich construction that combines heat-reflective aluminum .032" sheet inside and outside, plus 1" of 6# density glass fiber board. The low material cost and simplicity of field assembly bring installed cost to a new low. The rustproof and corrosion-resistant aluminum on both sides virtually eliminates painting, maintenance.

Exterior ribbed-embossed sheets 40" wide and up to 22' 5" in length eliminate horizontal joints on buildings with eave height up to 22'. Interior corrugated sheets are attractive and offer good light reflectivity. Choice of exterior treatments affords design flexibility. Write for data book.

A complete installation service is available. For name of nearest franchised jobber-erector, call the Reynolds office listed under "Building Materials" in classified phone books of principal cities. Or write to Reynolds Metals Company, Building Products Division, 2009 South Ninth Street, Louisville 1, Kentucky.

Specifications:

Exterior, .032" aluminum ribbed-embossed in 4" rib or 8" rib; or Industrial corrugated*

Interior, .032" industrial corrugated*

Over-all panel thickness, 2⅞".

Weight, per square foot, 1.57 to 1.63 lbs.

**For special requirements, .024" Intermediate Corrugated may be used as an exterior or interior skin.*

REYNOLDS ALUMINUM

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

* May 31—Clay Products, Lime, Plaster, Paint, Roofing, Wage Rates, Building Board, Lath, Insulation
* June 7—Cement, Aggregates, Ready-mixed Concrete, Asphalt
* June 14—Iron & Steel Products, Pipe

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR—

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)

All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft. (Prices in italics)

		1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	12x12 Rgh	PLYWOOD Rail freight increment (See note for base price) ⅜"	½"
Atlanta	†	$83 00	$85 00	$77 50	$76 00	$79 50	$83 00	$81 00					$22 32	$27 24
Baltimore	*	93 00	98 00	98 00	100 00	100 00	104 00	114 00			$170 00	$185 00	25 92	31 60
		110 00g	*110 00g*	*128 00g*	*128 00g*	*128 00g*	*128 00g*	*155 00g*	*$144 00*	*$144 00*				
Birmingham	†	86 00	88 00	81 00	88 00	91 00	96 00	111 00			115 00	160 00	21 78	26 58
		111 50	*111 50*	*114 50*	*115 00*	*115 00*	*116 50*	*114 50*	*111 50*	*111 50*				
Boston	s	112 00a	114 00a	116 00a	116 00a	116 00a	114 00a						25 92	31 60
		100 00n	*100 00n*	*124 00*	*124 00*	*124 00*	*125 00*	*150 00*	*158 00*	*145/155*				
Chicago	**	103 00	106 00	99 00	114 00	122 00	123 00	118 00			146 00	146 00	22 45	27 37
		114 00	*114 00*	*126 00*	*125 00*	*125 00*	*126 00*	*134 00*	*134 00*	*134 00*				
Cincinnati	*	101 25	102 50	90 00	98 25	103 00	111 50	119 50			141 75	141 75	25 00	30 48
		104 25	*106 25*	*116 00*	*117 75*	*119 00*	*119 25*	*145 00*	*145 00*	*145 00*				
Cleveland	**	99 00	101 00	109 00	105 00	105 00	106 00						25 37	30 93
				123 00	*118 00*	*118 00*	*118 00*	*136 00*	*136 00*	*136 00*				
Dallas	k‡	75 00	80 00	72 00	72 00	70 00	70 00	130 00			130 00	130 00	18 72	22 80
Denver	*	*Not in stock*		*126 00*	*121 00*	*121 00*	*125 00*	*158 00*	*155 00*	*164 00*			13 92	16 98
Detroit	‡	115 00	118 00	114 00	115 00	118 00	122 00						25 00	30 48
		125 00	*125 00*	*133 00*	*130 00*	*130 00*	*135 00*	*185 00*	*195 00*	*195 00*				
Kansas City	*	130 00	130 00	125 00	130 00	140 00	140 00						16 56	20 16
		130 00	*130 00*	*130 00*	*130 00*	*135 00*	*140 00*	*165 00*	*185 00*	*210 00*				
Los Angeles	s	*110 00*	*110 00*	*110 00*	*110 00*	*110 00*	*110 00*	*158 00*	*158 00*	*158 00*			16 61ab	20 25ab
Minneapolis	#	*135 00*	*135 00*	*145 00*	*145 00*	*145 00*	*145 00*	*185 00*	*185 00*	*185 00*			19 89	24 25
Montreal	ab	100 00	110 00	100 00	100 00	118 00	138 00				123 00	123 00		
		180 00	*180 00*	*180 00*	*180 00*	*180 00*	*180 00*	*170 00*	*170 00*	*170 00*				
New Orleans	†	106 00	106 50	96 50	91 00	96 00	100 00	124 00			156 00	154 00	18 72	22 80
	†	*121 50*	*121 50*	*126 50*	*121 50*	*121 50*	*121 50*	*144 00*	*148 00*	*144 00*				
New York	s	120 00	122 00	127 00	131 00	131 00	131 00	175 00			260/280	260/280	25 92	31 60
				129 50	*132 00*	*132 00*	*132 00*	*170/180*	*175/185*	*175/185*				
Philadelphia	‡	.....	Range from $117.00 to $137.00				117/137	117/137			214/224	214/224	25 92	31 60
			Range from $131.00 to $165.00				*131/165*	*156/158*	*165 00*	*165 00*				
Pittsburgh	†	103 00	107 00	104 00	105 00	110 00	110 00	165 00			145 00	.....	25 92	31 60
		120 00	*122 00*	*125 00*	*138 00*	*145 00*	*155 00*	*180 00*	*190 00*	*205 00*				
St. Louis	#	122 00	127 00	131 00d	135 00d	135 00e	138 00e						18 72	22 80
				139 00	*140 00e*	*141 00e*	*142 00e*	*198 00a*	*198 00*	*187 00*				
San Francisco	A	*98 00*	*98 00*	*97 00*	*97 00*	*97 00*	*97 00*	*116 00*	*159 00*	*155 00*			12 22	14 91a
Seattle	†	*74 00*	*79 00*	*81 00*	*81 00*	*81 00*	*81 00*	*110 00*	*110 00*	*115 00*				
Toronto	a	106 00	109 00	104 00	104 00	106 00	110 00	120 00			115 00	.....		
		116 00	*119 00*	*138 00*	*135 00*	*135 00*	*136 00*	*151 00*	*149 00*	*152 00*				

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd., truckload lots, 5/6 Mftbm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *g No. 1 common. *j 8ft. lengths. *k No. 3 common. *n #3. A incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Interior Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ¼", $179.00; on ¾", $201.00. Exterior ¼", $199.00, ¾", $223.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a Lower rate by water shipment. *b 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950a Single or Double Thickness A quality	B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	78%	78%	$0.2465
Baltimore	74%d	76%d	.2465
Birmingham	82%	83%	.1915
Boston	72-10%	72-10%	.2465
Chicago	74%	74%	.2465
Cincinnati	74%	74%	.2465
Cleveland	74-2-10%	74-2-10%	.2865
Dallas	75%	75%	.2540
Denver	73%	73%	.2515
Detroit	74-10-10%	74-10-10%	.2465
Kansas City	76-10%	76-10%	.2515
Los Angeles	71%	78%	.2490
Minneapolis	73-10%	73-10%	.2515
Montreal	40-10-5%bc	40-10-5%b	22.05h
New Orleans	76%	78%	.2515
New York	80%	80%	.4125g
Philadelphia	74%	76%	.2465
Pittsburgh	78%	78%	.2465
St. Louis	76-10%	76-10%	.2515
San Francisco	61%	69%	.2465
Seattle	68%	71%	.2490

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S.; $1.75 per 100 lb. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $80.00 for A quality, $52.75 for B quality. *b Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c Single thickness. *d Discount 6/15/52. *e Discount off. 12/31/54.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40% Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.1915	$0.2265	$0.2465
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.1965	.2315	.2515
Rocky Mtn. States	.1965	.2315	.2515
Pacific N. W. States	.1940	.2290	.2490
Pacific S. W. States	.1915	.2265	.2465

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	.....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	.....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	.....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	.....	.....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	.....	.....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50/.68	.....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	.....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	.....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.05	" 3a 1.70	2.78
Chicago	Red Oak		3.75a		4.50a
New York	S. L. Sap Pine	2.00	4.00	3.00	5.00
	Mixed Oak	2.50	4.50	3.50	5.50
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	White Oak	2.50		2.90	
	Red Oak	2.40	2.95a	2.65	3.30a
	Sap Pine or Cypress		2.85a		3.25a
San Francisco	Douglas Fir	2.56ef	3.48ef	3.35bf	5.12caf

Tr.—Treated; Untr.—Untreated. a Creosoted. b 7" x 9" x 8'. c Empty cel e Green. f f.o.b. cars. * Add 75¢/tie freight charge to Birmingham.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

Mass., Bedford—SCHOOL—BA 6/1—Town, J. Arthur St. Onge, chn. Bldg. Comn., 39 Pine St., elementary school, Page and Old Billerica Rds. $750,000. Plans deposit $50, refundable. Charles H. Cole II, 55 Waltham St., Lexington, archt. Cleverdon, Varney & Pike, 120 Tremont St., Boston, struct. engrs. CD 8/9.

BUILDINGS—LB & CA

Geo. A. Fuller Co., 11 Beacon St., Boston, Mass., CA, $900,000. 3 story, red brick, limestone trim SCHOOL, in-service training, HARTFORD, CONN. Travelers Insurance Co., 700 Main St., Hartford, Conn. Awarded May 7. CD 3/13.

MIDDLE ATLANTIC

BUILDINGS—BA

Md., Crownsville—MEDICAL and SURGICAL—BA 5/29—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, brick, concrete, steel medical and surgical bldg. Crownsville State Hospital. $750,000. Plans deposit $25, Gaudreau & Gaudreau, 330 N. Charles St., Baltimore, Zone 1, archts. J. L. Faisant & Assoc., 2455 Maryland Ave., Baltimore, Zone 18, struct. engrs., Egli & Gompf, 425 St. Paul St., Baltimore, Zone 2, mech. engrs. CD 1/25.

▲ **Md., Fort George G. Meade**—HOUSING—BA 6/22—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Zone 18, construct and finance armed services housing, 1,000 units, (Capehart), ENG-18-020-56-30. $5,000,000, McGaughan & Johnson, 2000 D St. N. W., Wash. 6, D. C., engrs.-archts. CD 1/19.

▲ **N. Y., Brookhaven**—MAGNET INCLOSURE—BA 6/28—Stone & Webster Engineering Corp., Brookhaven National Laboratory, Upton, 2,500 -lin. ft. reinf.-con. magnet inclosure similar to cut and cover tunnel, inside dimensions 17x19 ft. for alternating Gradient Synchrotron at Brookhaven National Laboratory for Associated Universities, Inc. CD 8/3/54, under CA.

N. J., West New York—HOUSING—BA 8/1—West New York Housing Auth., 5814 Park Ave., 84 housing units, 52 to 54 Sts. on Bergenline Ave. $800,000. Ricker & Axt, 6115 Hudson Ave., archts. CD 6/27/50.

HEAVY CONSTRUCTION—LB & CA

NEW YORK—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

Binghamton Bridge & Foundation Co., Inc., 656 State St., Binghamton, N. Y. CA $642,933. four-span 486 ft. bridge over Chenango River near Chenango Bridge, involving 0.69 mi., Broome Co. CD 4/20, under LB.

▲ **NEW YORK**—John W. Johnson, supt. State Dept. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

Harrison & Burrowes, Inc., 507 Summit Ave., Jersey City, N. J. LB $1,569,941, est. $1,570,000. (1 bidder) constr. 2 bridges, approaches, one to carry Rte. 370 over D. L. & W. R.R. in Baldwinsville and other to carry route over Seneca River near Cold Spring, Onondaga Co. Bids May 10. CD 4/25.

NEW YORK—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

Potter-DeWitt Corp., Pavilion, N. Y. LB $624,762 (4 bidders) constr. 2 sects. 3.18 mi. on Rte. 19 from South Warsaw to Rock Glen and from Rte. 19A intersection southwestward on new location to Rte. 78 intersection, Wyoming Co., Bids May 10. CD 4/25.

▲ **NEW YORK**—John W. Johnson, supt. State Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,

N. Y.—**Theodore Zoli Constr. Co., Inc.**, P.O. Box 336, 70 Adelaide Terrace, Torrington, Conn. CA $652,627, est. $805,000. (3 bidders) relocating 3.91 mi. Sect. of Rte. 10 starting about 3 mi. south of Malone and exten. northward to joint Rte. 37 between Maple and Huntington Sts., Franklin Co.;

N. Y.—**E. G. DeLia & Sons Constr. Corp.**, 30 Campion Rd., New Hartford, N. Y. CA $721,034, est. $868,000. (10 bidders) constr. 5.72 mi. Sect. of Rte. 148 bypass in Gloversville, Fulton Co.;

N. Y.—**Arute Brothers, Inc.**, 560 South Main St., New Britain, Conn. CA $1,925,180, est. $2,540,000. (10 bidders) reconstr. 6.53 mi. Tully Center to Lafayette sect. of Rte. 11, Onondaga Co.; CA $1,816,778, est. $2,401,000 (9 bidders) reconstr. 4.94 mi. Lafayette to Nedrow Sect. Rte 11 and 4.41 mi. of access roads, Onondaga Co.;

N. Y.—**S. J. Groves & Sons Co.**, 500 Wesley Temple Bldg., Minneapolis, Minn. CA $1,485,508, est. $1,486,000. (1 bidder) relocation 4.76 mi. Sect. of Rte. 37 along south side of Massena, incl. new Grasse River Bridge, St. Lawrence Co.;

N. Y.—**John Arborio, Inc.**, West Cedar St., Poughkeepsie, N. Y. CA $6,326,503, est. $7,199,000. (5 bidders) constr. 5.79 mi. four-lane divided Rte. 17 Liberty-By-Pass and 4.56 mi. access roads, Sullivan Co.;

N. Y.—**S. A. Scullen Co., Inc.**, Box 362, Waterford, N. Y. CA $1,984,886 est. $2,185,000. (6 bidders) reconstr., relocation 7.83 mi. Rte. 9 between Pottersville and Schroon Lake, Warren and Essex Counties. Grand total $14,912,516. CD 4/20, under LB.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

John H. Ensey, Inc., 1611 Ridgely St., Baltimore 30, Md. LB $980,475. surf. 1.52 mi. Washington Circumferential Hy., Contr. M 485-28-320, Montgomery Co. Bids May 8. CD 4/25.

▲† **Williams Constr. Co.**, Box 145, Middle River, Md. CA $2,095,746. site imprvs., utilities Glenn L. Martin Airport for Air National Guard, Ser. ENG-18-2020-56-17, MIDDLE RIVER, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. CD 4/30, under LB.

† **Baltimore Contractors, Inc.**, 711 S. Central Ave., Baltimore 2, Md. CA $969,000. buildings for Air National Guard at Glenn L. Martin Airport, Ser. No. ENG-18-020-56-18, MIDDLE RIVER, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. CD 5/10, under LB.

BUILDINGS—LB & CA

▲ **Edward Corning Co.**, 204 E. 39 St., New York 16, N. Y. LB $1,419,000. general constr., New Malverne HIGH SCHOOL, on Pines Pond, Pamblers Field area east side of Ocean Ave., Attermations of Wick Lane and Aberdeen St., MALVERNE, N. Y. Bd. Educ., Union Free School Dist. No. 12, town of Hempstead, Malverne High School, Ocean Ave., Malverne, N. Y. Bids May 10. CD 4/18.

▲ **Harry Miller**, c/o Roth & Miller, 972 Broad St., Newark, N. J. Owner Builds, $1,500,000. HOMES, Wynchfield Manor, East Broad St. and Springfield Ave., WESTFIELD, N. J. William G. Chirgotis, 968 Stuyvesant Ave., Union, N. J., archt.

Wildberger Best Constr. Co., 2025 E. North Ave., Baltimore 13, Md. LB $733,460, est. $400,000 (5 bidders) masonry Lehigh Elementary SCHOOL, Glen Burnie, ANNAPOLIS, MD. Anne Arundel Co. Bd. Educ., Annapolis, Md. Bids May 1. CD 4/19.

Hamilton Heights Constr. Corp., 3004 Ridgewood Ave., Baltimore 25, Md. Owner Builds. $617,800. forty-two 40x30x2E ft. brick veneer DWELLINGS, Fleetwood, Pinewood and Westfield Aves., and Northern Parkway, BALTIMORE, MD. Laurence A. Menefee, 347 N. Charles St., Baltimore 1, Md., archt.

▲ **L. J. Keller, Jefferson, Md.** LB Over $1,000,000. (5 bidders) concrete, steel, masonry Frederick JUNIOR HIGH SCHOOL, FREDERICK, MD. Bd. Educ., Frederick Co., Frederick, Md. Bids May 8. CD 4/25.

▲† **John McShain, Inc.**, 1501 N. Arlington Ridge Rd., Arlington, Va. CA $8,288,900. AEC HEADQUARTERS, GERMANTOWN, MD. Atomic Energy Comn., 1717 H St. N. W., Wash., D. C. Bids May 3, awarded May 11. CD 5/7, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

SOUTH

BUILDINGS—BA

▲ **Va., Fort Lee**—HOUSING—BA On Or About 6/13—U. S. Eng., foot of Front St., Norfolk, Zone 1, construct and finance, Capehart family housing, 121 buildings, 4 to 8 units each, off site imprvs. and utilities, Fort Lee-Richmond Qcartermaster Depot. $7,000,000. Lublin, McGaughy & Assocs., 220 W. Freemason St., Norfolk, archts.-engrs. CD 1/25, under Public Buildings.

HEAVY CONSTRUCTION—LB & CA

▲ **Gust K. Newberg Constr. Co.**, 99 N.E. 71 St., Miami, Fla., CA, $5,627,000. 20th St. Terminal Bldg., Miami International Airport, MIAMI, FLA. Bd. Comrs. Dade Co., Court House, Miami, Fla. Bids Apr. 3. CD 4/10, under LB.

BUILDINGS—LB & CA

† **John W. Daniel & Co., Inc.**, River Rd., Danville, Va. LB $977,800. 11 BUILDINGS at Glass House Point, JAMESTOWN, VA. Virginia 350th Anniversary Comn., Jamestown, Va. Ballou & Justice, 106 E. Cary St., Richmond, Va., engrs.-archts.

▲ **H. L. Coble Constr. Co.**, 1705 Battleground Ave., Greensboro, N. C., LB $3,497,000 (8 bidders) construct and finance, 284 units Capehart HOUSING, ENG-31-075-56-51, FORT BRAGG, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 10. CD 5/3.

R. N. Rouse & Co., 1019 N. William St., Goldsboro, N. C., LB $611,658. SENIOR HIGH SCHOOL, GOLDSBORO, N. C. Goldsboro Graded Schools, Ray Armstrong, supt., 412 N. William St., Goldsboro, N. C. Bids May 3. CD 4/12.

▲ **Holiday Constr. Co.**, 1150 N.E. 163 St., North Miami Beach, Fla., CA, $2,500,000, 279 RESIDENCES, S. Lake Forest Blvd. and Lake Shore Dr., NORTH MIAMI BEACH, FLA. Norman Fienberg & Paul Bell, 1150 N.E. 136 St., Miami Beach, Fla. R. J. Schneider, 1431 Flamingo Way, Hialeah, archt.

▲ **Ray M. Lee Co.**, 1004 Edgewood Ave. N. E., Atlanta, Ga., CA, $1,199,203, bldg. for city electrical system and OFFICES, HUNTSVILLE, ALA. City, City Hall, Huntsville, Ala. Turner & Northington, Medical Arts Bldg., Florence, Ala., archts. Awarded May. 4.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Light & Power, Vincent M. DeMelto, comr., City Hall, Zone 14, two 69,000 volt feeder lines from Lake Rd. Sub-station to Collinwood Station and two 69,000 feeders from Lake Rd. to W. 41 St. Station. lines to be inclosed in oil-filled tubes. $3,000,000. Plans deposit $100. Vincent DeMelto, c/o owner, engr. CD 1/27/54, under Public Buildings.

HEAVY CONSTRUCTION—LB & CA

▲† **United Constr. Co.**, 1204 Lincoln Ave., Pittsburgh, Pa., CA $1,270,872, est. $1,136,957, Willowick NIKE site; CA $1,121,278, est. $1,013,108, Fairview Park NIKE site, Cuyahoga Co., OHIO. U. S. Eng., New Post Office Bldg., Pittsburgh, Pa. Bids Apr. 24, awarded May 4. CD 5/3 under LB.

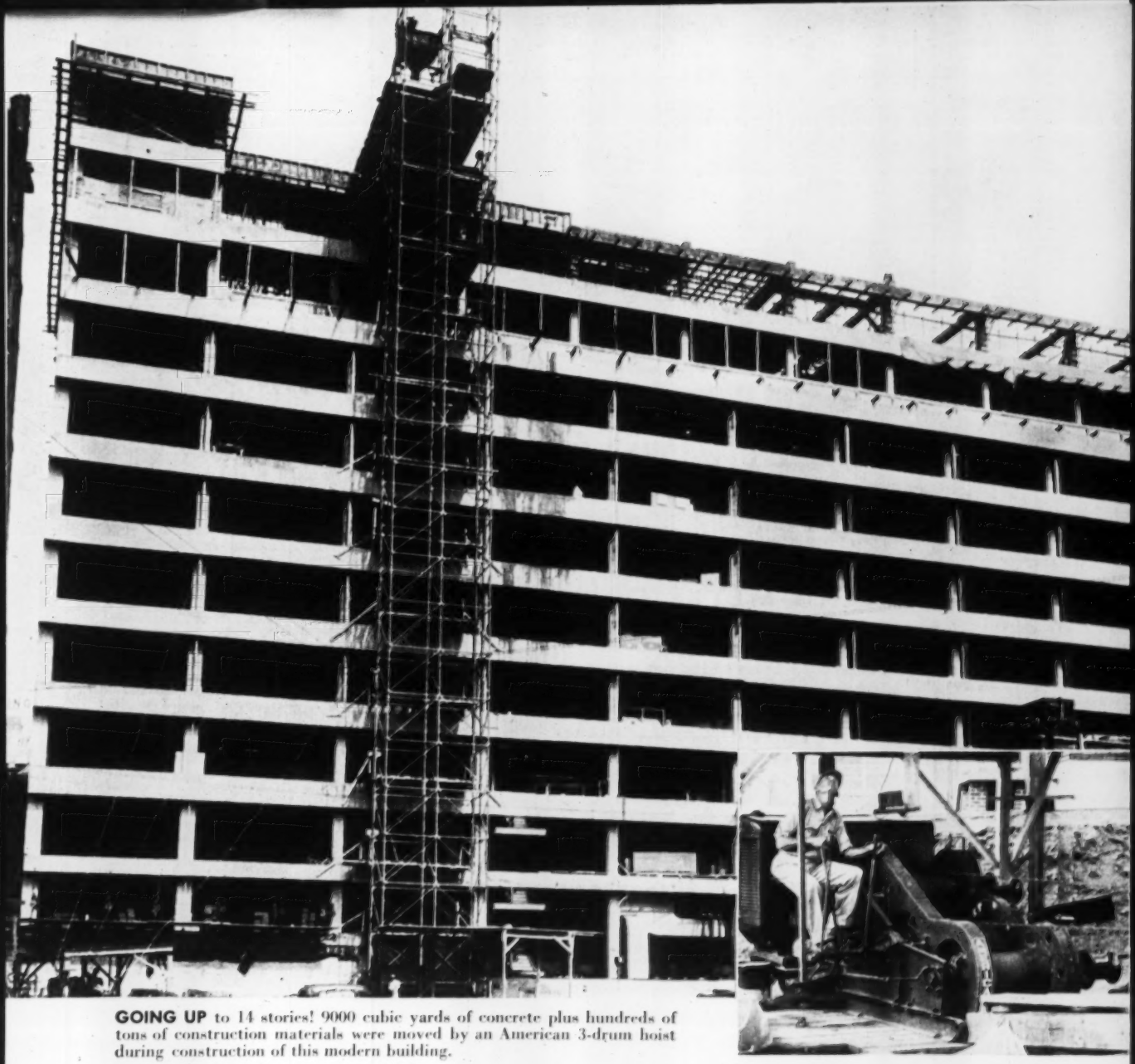
▲† **Dyer Constr. Co.**, 1716 Sheffield St., Dyer, Ind., CA, $2,334,816, runway exten., Greater Peoria Airport, Serial No. ENG-11-032-56-49, PEORIA, ILL. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids Apr. 19. CD 3/19.

BUILDINGS—LB & CA

▲ **Pigeon Hole Constr. Co.**, 230 W. Commerce St., Youngstown, O., CA general constr. multi-story lift-slab GARAGE, 9th and Vine Sts. CINCINNATI, O. Est. $1,500,000. Citizens Security Corp., 528 Walnut St., Cincinnati, O. Richard M. Gensert & Assocs., The Arcade, Cleveland, O., structural engrs. CD 7/20/55, under Pigeon Hole Parking Co., as owner; Central Lift Slab Co., 2215 Ontario St., Cleveland, O., CA lifting contr. (Cincinnati, O.).

▲ **Albert M. Higley Co.**, 2036 E. 22 St., Cleveland 15, O., CA Est. $1,000,000. 1 story 82,000 sq. ft. brick bldg. for glass parts WAREHOUSE and ZONE SALES OFFICE, CLEVELAND, O. Chevrolet Div. of General Motors Corp., 3044 W. Grand Blvd., Detroit, Mich.

(Continued on page 86)



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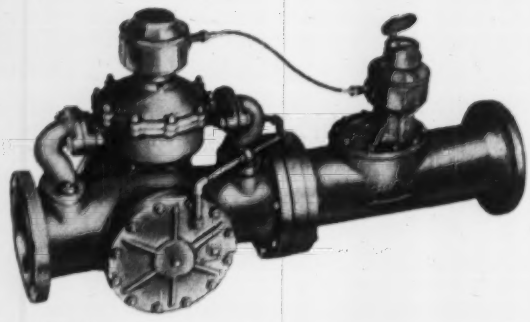

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DALLAS 1 ..... 505 N. Erway Street
KANSAS CITY 6, MO ..... 6 E. Eleventh St
225 North Temple City Blvd. EL MONTE, CALIF.
650 First Avenue ..... WEST ROSELLE, N. J.
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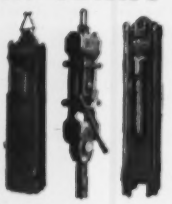

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Sweets 2c/Cod

(Continued from page 84)

Allen & Kelley, Architects & Builders Bldg., Indianapolis, Ind., archts. Awarded Mar. 15.

▲ **B & B Constr. Co.**, 1616 Covington St., Youngstown, O. CA Est. $1,000,000 (7 bidders) 200,000 sq. ft. WAREHOUSE, Rockside Rd., MAPLE HEIGHTS, O. Pick-N-Pay, 3621 Chester Ave., Cleveland 14, O. L. K. Norman, c/o owner, engr. Awarded May 5. CD 2/1.

▲ **Knowlton Constr. Co.**, 1133 W. Columbus St., Bellefontaine, O., LB $1,727,000 general constr. TROY HIGH SCHOOL, TROY, O. Bd. Educ., 530 E. Main St., Troy, O. Bids May 8. CD 4/16.

▲ **Traylor Bros., Inc.**, Station B, Box 66, Evansville, Ind., CA Est. $9,000,000. design and construct 90,000 sq. ft. addn. PLANT No. 2, EVANSVILLE, IND. Whirlpool-Seeger Corp., 225 W. Morgan St., Evansville, Ind. CD 5/11.

▲ **Glenn L. Ryan Builders**, 4323 Miller Ave., Gary, Ind., Own Forces, $1,440,000. 100 HOMES, GARY, IND. Cliff Wariner, 527 Broadway, Gary, Ind., archt.

▲ **Timrick Development Co.**, 1050 Cherry St., Hammond, Ind., Own Forces. $6,000,000. 300 HOMES, incl. sewers and streets, MUNSTER, IND.

▲ **William A. Jungclaus Co., Inc.**, 825 Massachusetts Ave., Indianapolis, Ind., CA $1,106,000, general constr. OPERATIONS CENTER opposite Riverside Pumping Station, on Speedway Ave., INDIANAPOLIS, IND. Indianapolis Water Co., 113 Monument Circle, Indianapolis 4, Ind. Grand total $1,813,765. CD 4/6; **Freyn Bros.**, 1028 N. Illinois St., Indianapolis, Ind., CA $361,546, heating and plumbing (Indianapolis, Ind.); **Long Electric Co.**, 36 W. Washington St., Indianapolis, Ind., CA $346,219, electric (Indianapolis, Ind.).

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland Ave., Chicago, Ill., CA $3,299,511. Niles Twp. HIGH SCHOOL BLDG. NO. 2, Edens Hy. and Oakton St., SKOKIE, ILL. School Dist. 219, c/o Niles Twp. High School No. 1, Skokie, Ill. Bids Apr. 16, awarded May 7. CD 5/7, under LB.

▲ **Fruin-Colnon Contg. Co.**, 1706 Olive St., St. Louis 3, Mo., CA $3,000,000 compounding house revision, oil canning PLANT, revision tank farm, cross-country conveyers, railroad spurs, roadway, etc., WOOD RIVER, ILL. Shell Oil Co. Inc., Wood River Refinery, Wood River, Ill. CD 2/8.

O. W. Burke Co., 1032 Fisher Bldg., Detroit, Mich. LB $842,987, MUNICIPAL PARKING GARAGE, Second and Howard Sts., DETROIT, MICH. City, John D. McGillis, dir. Municipal Park Auth., 1214 Griswold St., Detroit, Mich. Bids May 8. CD 4/8.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲ **Okla., Norman**—LIBRARY—BA 6/14—Bd. Regents Capitol, Oklahoma City, Zone 5, library addn. at University of Oklahoma. $2,700,000. Plans deposit $100. Coston & Frankfurt, 323 E. Madison St., Oklahoma City, archts. CD 10/25.

Tex., Denton—DORMITORY—BA 6/28—State Bd. Regents, Tribune Bldg., Austin, 3 story brick, tile mens dormitory, North Texas State College. $700,000. Plans deposit $25. Wilson, Patterson & Assocs., 601 Bailey St., Fort Worth, archts. CD 4/11.

BUILDINGS—SLC

▲ **Okla., Oklahoma City** — OFFICE — Liberty National Bank & Trust Co., Liberty Bank Bldg., soon lets contract 14 story office and parking bldg., 216 N.W. 2nd St. $1,000,000. Bailey & Bozalis, Colcord Bldg., archts. CD 10/6.

HEAVY CONSTRUCTION—LB & CA

▲ **V. & M. Contg. Co., Inc.**, 4030 Chouteau Ave., St. Louis 10, Mo. LB $1,102,375, est. $912,000. (6 bidders) reconstr. coagulant house and constr. new chemical treatment wing at Chain of Rocks Water Works Pumping Station on Mississippi River north end of city, ST. LOUIS, MO. City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market Sts., St. Louis 3, Mo. Bids May 8. CD 4/10.

▲ **Northern Pacific Ry. Co.**, 176 E. Fifth St., St. Paul, Minn. Own Forces. $1,600,000. install centralized traffic control sys. between Livingston and Helena 123 mi. with Missoula as control point, MONTANA.

▲† **Capitol Steel & Iron Co.**, P.O. Box 2489, Stockyard Sta., Oklahoma City, Okla., CA, $2,059,922, furnishing, fabricating, erecting structural steel academic bldg., No. 05-613-56-17, COLORADO SPRINGS, COLO. Dpt. Air Force, Pentagon Bldg., Wash., D. C. Bids May 1, awarded May 7. CD 5/8, under LB.

▲ **Olsen Constr. Co. of Wyoming**, 2000 E. Pershing Blvd., Cheyenne, Wyo., LB $1,000,000. lodge at Grand Teton National Park; and 3 dormitories at Jackson Lake Lodge, near Jackson, WYOMING. Grand Teton Lodge Co., 209 Post St., San Francisco, Calif. Spencer & Ambrose, 251 Kearny St., San Francisco, Calif., archts.

BUILDINGS—LB & CA

▲ **Manhattan Constr. Co. of Texas**, 2828 Pease St., Houston, Tex., CA $4,318,060. main unit cement mfg. PLANT expansion, HOUSTON, TEX. Ideal Cement Co., Denver National Bldg., Denver 2, Colo. Bids May 1. CD 3/28.

▲ **Spiegelberg Lumber & Bldg.**, 259 W. Fremont St., Laramie, Wyo., LB $1,811,800, est. $1,750,000. LIBRARY, SERVICE and GEOLOGY BLDG. LARAMIE, WYO. State of Wyo., University of Wyoming, Campus, Laramie, Wyo. Bids May 4. CD 4/12.

▲ Abe Perlmutter Constr. Co., 401 Navajo So., Denver, Colo., CA, $1,000,000. new prestressed concrete TERMINAL, DENVER, COLO. Navajo Freight Lines, 381 South Broadway, Denver, Colo.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

† Interstate Electric Co., Inc., 540 W. 7 St., Salt Lake City, Utah, CA, $681,567, power sub-station addns., another sub-station at National Reactor Testing Station, AT (10-1)-818, ARCO, IDAHO. Atomic Energy Comn., Idaho Operations Office, Box 1221, Idaho Falls, Idaho. Bids Apr. 18. CD 5/11, under LB.

▲ Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., CA $1,814,315. 2,900 ft. diversion tunnel, 32 ft. diam. for Swift Creek Dam Proj. Cowlitz Co., WASHINGTON. Pacific Power & Light Co., 920 S. W., 6 Ave., Portland, Ore. Awarded May 2. CD 10/21/53.

† Shea Co., 2801 W. Mission Rd., Alhambra, Calif. CA $957,280 Hills Creek Reservoir diversion tunnel and detour road, CIVENG-35-026-56-171, Lane Co., OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids May 1, awarded May 7. CD 5/3 under LB.

▲† R. V. Lloyd & Co., Coachella, Calif., LB $2,805,103, est. $2,339,076, Shafter-Wasco laterals and sublateral Unit 1, Lateral 134.4 Station 249 plus 54, Central Valley Proj., Kern Co., Spec. DC-4663, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Lindsay, Calif. Bids May 8. CD 4/2.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Fredrickson & Watson Constr. Co., and Ransome Co., 873 81 Ave., Oakland, Calif., LB $1,785,555 est. $1,972,000. (4 bidders) grading, surf. facing plant mix on cement treated base, 1.2 mi. haul road undercrossing constr. and bridge widening, between Carquinez Bridge and 0.5 mi. north of Vallejo Wye, Solano Co. Bids May 9. CD 4/13.

▲† Winston Bros., 1530 California St., Monrovia, Calif., CA, $1,960,780, est. $2,000,000, Los Angeles River Imprvt., Florence Ave. to Stewart and Jay Rd., Downey, Los Angeles Co., CIVENG-04-353-56-51, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 1, awarded May 8. CD 5/3, under LB.

▲† Fred J. Early Jr. Co., Inc., 22138 S. Vermont Ave., Torrance, Calif., LB $1,299,500, est. $700,000. utilities modernization and exten., North Island, NOy 90838, Spec. 49515, SAN DIEGO, CALIF. Eleventh Naval Dist., San Diego, Calif. Bids May 8. CD 4/18.

BUILDINGS—LB & CA

▲ Guthrie Constr. Co., N2918 Nevada St., Spokane, Wash., Day Labor. $1,000,000. 60 HOUSES in Spokane Valley, between Sprague and Valley Way, Holiday Rd. to Family Dr., SPOKANE, WASH. CD 1/3.

Corey & Medwin, 5020 Rodeo Rd., Los Angeles, Calif., Owner Builds. $942,400. 99 frame, stucco DWELLINGS, Rosecrans and Castawa Ave., etc. BELLFLOWER, CALIF.

▲ Gust K. Newberg Constr. Co., 2040 N. Ashland St., Chicago, Ill. CA, $7,037,000. 3 story Veterans HOSPITAL addn., LONG BEACH, CALIF. Veterans admin., Munitions Bldg., Wash., D. C. Bids Apr. 24. CD 4/26, under LB.

▲ Del E. Webb Constr. Co., 121 Broadway, San Diego, Calif. CA $1,485,250. 121 frame stucco DWELLINGS, Clairmont Tract No. 17, SAN DIEGO, CALIF. Alex Homes, 3642 Clairmont Dr., San Diego, Calif.

CANADA

HEAVY CONSTRUCTION—LB & CA

ALBERTA—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., New West Constr. Co. Ltd., 10480 113 St., Edmonton, Alta., LB $852,622, culverts, grading, base course, prime for Mile 22 to Mile 28, Banff-Jasper Hy., Banff.

▲ Dupont Constr. Ltd., 355 Rogers Rd., Toronto, Ont., CA, $1,618,688, John St. Pumping Station exten., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Mar. 26, awarded May 4. CD 4/23, under LB.

BUILDINGS—LB & CA

▲ Burns & Dutton Concrete & Construction Co. Ltd., 9004 125 Ave., Edmonton, Alta., LB $1,113,817, 3 story, part bsmnt., 140x400 ft., rein.-con., brick ADMINISTRATION BLDG., Griesbach Army Barracks, EDMONTON, ALTA. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 26. CD 4/9.

▲ J. A. Pollard Constr., 2610 Rock Bay, Victoria, B. C., CA, $1,713,100, combined TECHNICAL TRAINING ESTABLISHMENT and outside services, ESQUIMALT, B. C. Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont. CD 3/16/55.

▲ Pigott Constr. Co. Ltd., Pigott Bldg., Hamilton, Ont., CA, $2,032,813 (6 bidders) 6 story, bsmnt., 80x140 ft., steel masonry DEPARTMENT STORE exten., HAMILTON, ONT. T. Eaton Co. Ltd., 190 Yonge St., Toronto, Ont. Bids Apr. 24, awarded May 7. CD 4/17.

▲ Frid Constr. Co. Ltd., 605 James St. N., Hamilton, Ont., CA, $4,000,000 (7 bidders) 17,000 sq. ft. PLANT EXTENSION, OAKVILLE, ONT. Ford Motor Co. of Canada Ltd., 120 Bloor St. E., Toronto, Ont. L. J. Donaldson, c/o owner, engr. Bids May 1, awarded May 8. CD 4/18.

▲ B. Perini & Sons Canada Ltd., 49 Jackes Ave., Toronto, Ont., CA, $2,000,000. 6 story, 92x163 ft. rein.-conc., structural steel ADMINISTRATION BLDG., TORONTO, ONT. Toronto Transit Comn., 35 Yonge St., Toronto, Ont. Bids May 1, awarded May 9. CD 4/30.

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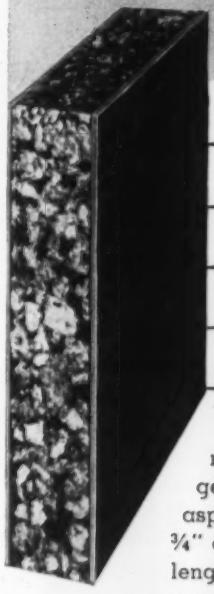

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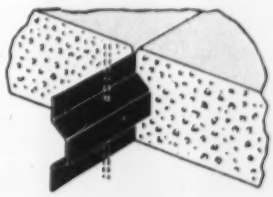

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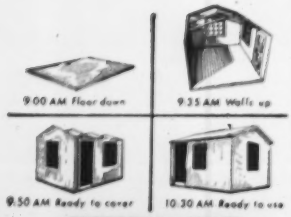

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▲ **Pigott Constr. Co. Ltd.**, 1250 Bay St., Toronto, Ont., CA $2,000,000 (7 bidders) 7 story, 48,000 sq. ft. rein.-con., brick OFFICE BLDG. incl. SERVICE STATION and streetcar loop, TORONTO, ONT. Regent Refining (Canada) Ltd., 184 Bay St., Toronto, Ont. Bids May 8, awarded May 9. CD 5/1.

▲ **G. S. Shipp & Son Ltd.**, 1177 Queen Elizabeth Way, Port Credit, Ont., Owner Builds, $3,750,000, 250 BUNGALOWS, first stage of residential and industrial development, TORONTO, ONT. Hanks & Irwin, 2848 Bloor St. W., Toronto, Ont., archts.

▲ **Derby Development Corp. & J. H. Smith Constr. Co. Ltd.**, 6268 Cote des Nieges Rd., Montreal, Que. Owner Builds, $1,500,000, 100-bungalow HOUSING DEVELOPMENT, MONTREAL, QUE. Barrott, Marshall, Montgomery & Merrett, 1425 Mountain St., Montreal, Que., town planning consultants.

▲ **La Co-operative d' Habitation de Montreal**, 337 Craig St. E., Montreal, Que. Owner Builds. $1,000,000. 125-unit HOUSING, MONTREAL, QUE.

Merton Crest Homes Ltd., 6201 Cote St. Luc Rd., Montreal, Que. Owner Builds. $900,000. HOUSING, MONTREAL, QUE. David Reich, 5810 Cote St. Luc Rd., Montreal, Que., archt. CD 3/7.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Mich., Wyandotte**—Taylor Twp., Harold Rippe, superv. water sys., 12- to 24-in. c.i. water mains. $2,800,000. Edwin M. Orr, 22149 Michigan Ave., Dearborn consult. engr.

▲ **Que., St. Hubert**—Town, Town Hall, water and sewer service exten., $2,434,806; filtration plant, water and sewer services for St. Hubert, Laprairie & Notre-Dame du Sacre Coeur. $1,633,415. J. A. Beauchemin & Assocs., 1610 Sherbrooke St. W., Montreal, consult engrs.

SEWERS, WASTE DISPOSAL

▲ **N. J., Trenton**—Hamilton Twp., Greenwood Ave. sewer installations, Rte. 33, Rte. 130 and East State St. exten., S. Broad St., Regina Ave., sect. of Mercerville, Whitehead Manor, Hamilton Square and three other sects. of twp. $1,800,000. Myron X. Feld, 2090 Greenwood Ave., consult. engr. CD 4/13.

▲ **O., Warren**—Comrs. Trumbull Co., Court House, sewer and water sys. for Mineral Ridge Area. $1,215,000. Snyder, McLellan & Assocs., Hillsboro, Ind., consult engrs.; Carl W. Ziegler, c/o owner, engr.

▲ **Tenn., East Ridge**—Town, voted referendum on Apr 5, sanitary sewerage sys. and sewage treatment plant $3,700,000. Bids on or before July 1. Schmidt Eng. Co., 817 Broad St., Chattanooga, Zone 2, and Betts Eng. Co., 514 Lookout St., Chattanooga, engrs. CD 3/6/53.

BRIDGES

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave. Hartford.
Litchfield Co.—replace Cass Ave. and Bridge St. bridges Winsted. $1,000,000. Bids in August.
new bridge at Wallen St., Winsted. $100,000.
4 bridges, Division St., Munro St., Rugg Brook Rd., Yates Rd. in Winsted, $400,000. Bids in July or August. Howard, Needles, Tammen & Bergendoff, 20 Farmington Ave., Hartford, consult. engrs.

STREETS AND ROADS

▲ **O., Cuyahoga Falls**—City, streets, extend 2nd St from Hudson Dr. past Jct. area thru Vincent St. and to Landon Dr. in Silver Lake. $1,000,000. CD 7/28/54.

AIRPORTS

▲ **Ala., Birmingham**—TERMINAL—Birmingham Civil Aviation Advisory Council, City Hall, plans by Charles McCauley, Jackson Bldg., terminal, Birmingham Municipal Airport, $2,500,000-$3,000,000. CD 8/2.

▲ **N. Y., Idlewild**—HOTEL—Port of New York Auth. 111 8th Ave., New York, Zone 11, plans by William B. Tabler, 401-415 7th Ave., New York, Zone 1, 6 story, 320-room hotel, 10-acre tract, Van Wyck Expressway and Southern State Parkway, 134 St and 150 Ave. $4,000,000. CD 11/17.

▲† **R. I., Newport**—BARRACKS—First Naval Dist., 495 Summer St., Boston, Mass., plans by Michael Traficante, 175 Taunton Ave., East Providence, enlisted men barracks (3rd increment), U. S. Naval Air Station FY-1958. $1,000,000.

▲ **Wash., Renton**—HANGAR—Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Zone 4, 2 place B-52 paint and finish hangar. $3,000,000. Wilson & Co., 705 E. Crawford St., Salina, Kan., consult. engrs. CD 3/7.

LATIN AMERICA

▲ **Venezuela**—Ministry of P. Wks., Caracas,
plans 60 mi. Pan American Hy. between 1st sect. of road from Las Tejerias to Valencia. $9,000,000. Bids soon.

▲ **Venezuela, Puerto Cabello**—Ministry of P. Wks. Caracas,
plans dredging at shipyards and docks. $3,000,000. Bids soon.

PUERTO RICO

▲ **Puerto Rico**—HOUSING—Housing Auth. of Puerto Rico, 1,084 units of housing at 10 locations. $9,608,486. Approved by H & HFA.

U. S. POSSESSIONS

▲ **Hawaii, Honolulu**—HOUSING—Honolulu Housing Auth., Honolulu, 118 unit housing. $1,257,600. Approved by H & HFA.

▲ **Virgin Islands**—HOUSING—Virgin Island Housing Auth., 70 unit housing. $1,031,915. Approved by H & HFA.

FOREIGN

▲ **Burma**—CARGO BERTH STORAGE—Port of Rangoon, Commissioners, Rangoon, plans reconstr. cargo berth storage facilities, etc. $14,000,000.

▲ **Norway**—Norwegian Watercourse & Electricity Bd., Oslo, plans hydro electric development in Tokke and Vinje River sys. World bank made $25,000,000 loan for 1st stage.

PUBLIC BUILDINGS

▲ **Calif., Duarte**—SCHOOLS—Monrovia-Duarte Union High School Dist., Monrovia, plans by Smith, Powell & Morgridge, 208 W. 8 St., Los Angeles, first increment of 4 schools, Duarte Site. $1,000,000. CD 11/16.

▲ **Calif., Long Beach**—HOSPITAL, etc.—City, City Hall, plans by Jones, Poper & Lockett, Hugh Gibbs & Kenneth Wing, 1870 American Ave., Long Beach, new 550-bed multi-story, general hospital, nurses home and training center. $8,850,000. CD 2/15.

Calif., Ontario—SCHOOL—Chaffey Union High School Dist., 4 and Euclid Sts., voted $700,000 bonds, Upland High School addns. CD 3/19.

▲ **Conn., Fairfield**—SCHOOL—Town Bd. Educ., Town Hall, plans by Lyons & Mather, 211 State St., Bridgeport, Osborn Hill Elementary School, Stillman Rd. corner Pansy Rd., $1,000,000. CD 3/28.

▲ **Conn., New Haven**—WOODRUFF CENTER—State Pub. Wks. Dpt., 165 Capitol Ave., Hartford, Woodruff Center addn., 1418 Chapel St. $3,200,000. P. J. Caroll, c/o owner, engr.

▲ **Conn., Trumbull**—SCHOOLS—Town, Bd. Educ., Trumbull, Junior High School $1,000,000; high school, $1,500,000.

▲ **Conn., Wethersfield**—OFFICE, etc—State P. Wks. Comr., State Office Bldg., Hartford, plans by Henry F. Ludorf, 100 Pearl St., Hartford, Proj. CP-S-42, office and garage, 19-acre tract Wolcott Hill Rd. $3,500,000. Joseph Coel, 207 Plainfield St., Hartford, structural consult. engr. CD 5/2.

▲† **Idaho, Arco**—TEST, etc.—Atomic Energy Comn., Idaho Operations Office, Idaho Falls, plans by R. M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., test building, shielded control and equipment building, supporting facilities in Aircraft Nuclear Propulsion Area of National Reactor Testing Station. $12,000,000. Work to start next spring. CD 3/24/49.

▲ **Ind., Bloomington**—UNION BUILDING—Bd. Trustees Indiana University, Bloomington, plans by Edward D. James, 122 E. Michigan St., Indianapolis, Zone 4, and Eggers & Higgins, supervising archts., 100 E. 42 St., New York, N. Y., 7 story union building addn. $7,500,000.

▲ **Mass., Brookline**—TOWN HALL—Town Bd. Selectmen, Town Hall, Brookline, town hall, $1,750,000.

▲ **Mich., Dearborn**—SCHOOLS—Bd. Educ., 5757 Neckel St., voted bonds April 30, Senior High School, southwest sect. $4,000,000; Junior High School, $3,500,000; Ford Comm Col. addn. to provide library, classrooms and office, $1,000,000; addns. to 4 other schools. Total est. $14,000,000. CD 3/13.

▲ **Mich., Mount Clemens**—HOUSING—City, Pub. Housing Admin., 100 housing units. $1,200,000.

▲ **Mich., River Rouge**—HOUSING—City, William M. Duncan, dir. Pub. Housing Comn., City Hall, Coolidge Hy., plans by Arthur Greig & Assoc., 10530 W. Jefferson Ave., 100 housing units. $1,300,000.

▲ **Mich., Wayne**—SCHOOL—Bd. Educ., Wayne Twp., 34918 Sims St., plans by Yamasaki, Leinweber & Assoc., 112 Madison St., Detroit, Junior High School, Howe and Annapolis Sts. $2,500,000. CD 3/1.

▲ **Minn., Alexandria**—SCHOOL—Bd. Educ., A. O. Haffdal, supt. Schools, voted $1,200,000 bonds Apr. 30, high school. Traynor & Hermanson, St. Cloud, archts. CD 4/6.

▲ **Minn., Golden Valley**—SCHOOL—Bd. Educ., Independent School Dist. No. 89, Grace Seed, clk., Golden Valley, Minn., plans by Hammel & Green, 1932½ University Ave., St. Paul, high school. $1,100,000. CD 4/17.

▲ **Mo., Jefferson Barracks (St. Louis 23 P. O.)**—HOUSING—St. Louis County Housing Auth., Robert J. Tracy, exec. secy., 1316 Sherman Dr., Lemay, Zone 23, plans by Leo A. Daly Co., 411 N. 7 St., St. Louis, Zone 1, 250-housing unit, of 25 acre tract of old Jefferson Barracks Reservation. $2,500,000.

▲ **N. J., Elizabeth**—HOUSING—Housing Auth. of Elizabeth, 688 Maple Ave., plans by Pohlman & Henry, 1145 E. Jersey St. 250-family housing, adjacent to Pioneers Homes, Front St. to Broadway. $3,746,292.

▲ **N. J., Perth Amboy**—HOUSING—Perth Amboy Housing Auth., Perth Amboy, 200 public housing units. $2,772,288. CD 6/27/50.

▲ **N. J., Ridgefield**—SCHOOL—Bd. Educ., Ridgefield Boro, plans by Lawrence Licht, 19 Knickerbocker Rd., Englewood, high school, Veterans' Memorial Park, Walnut and Oakland Ave. $1,515,493.

▲ **N. Y., Lewiston**—SCHOOLS—Niagara-Wheatfield Central School, Lewiston, bond election May 24, high school, $4,381,000; grade school addn., $422,000; pool, $275,000.

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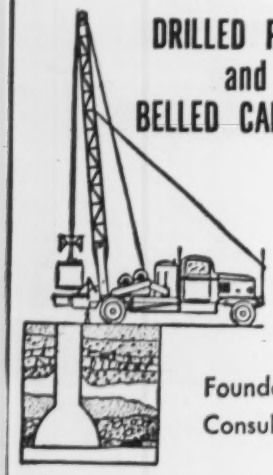

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▲ **N. Y., Randolph**—SCHOOL—Randolph Central School, elementary school, $1,350,000. Bond election first week in June.

▲ **N. Y., Uniondale**—COUNTY HOME—Nassau Co., Dpt. P. Wks., Old County Court House, Mineola, plans by Jagrow & Heidelberger, 658 Fulton Ave., Hempstead, county home for aged. $2,000,000. CD 2/7.

▲ **O., Bedford**—SCHOOLS—Bd. Educ., 91 Tarbell St., voted bonds May 8, schools. $3,820,000. CD 11/22.

▲ **O., Brooklyn**—SCHOOLS—Bd. Educ., 9700 Biddulph Ave., Cleveland, Zone 9, voted bonds May 8, schools. $1,300,000. CD 1/12.

▲ **O., Cambridge**—SCHOOLS—Bd. Educ., Cambridge, defeated bonds May 8, schools. $1,500,000. CD 5/2.

▲ **O., Perry**—SCHOOL—Perry Local Bd. Educ., Perry, voted bonds May 8, schools. $1,140,000. CD 11/10/53.

▲ **Pa., Phila.**—HOUSING—Phila. Housing Auth., 42 S. 15 St., plans by Martin-Stewart & Noble, 117 S. 17 St., Hoffman Housing, 55 and Vine Sts. $2,265,000. CD 11/29

▲ **Pa., Pittsburgh**—SCHOOL—School Dist. of Baldwin Twp., Whitehall, Pittsburgh, plans by Altenhof & Brown, Park Bldg., 1 story, brick, block, steel Baldwin Twp. High School addn., Whitehall. $2,000,000.

▲ **Tex., Austin**—STUDENT UNION—University of Texas, Bd. Regents, Main Administration Bldg., Austin, student union bldg. addn., renovating existing union bldg. $2,125,000. CD 8/16/44.

▲ **Tex., Laredo**—HOUSING—Laredo Housing Auth., Laredo, 200 unit housing. $2,382,030. Approved by H & HFA. CD 9/9/52.

▲ **Utah, Salt Lake City**—MENTAL TREATMENT CENTER—Utah Welfare Comn., Capitol Bldg., 250-bed mental treatment center adjoining proposed University Medical Center. $2,000,000-$3,000,000.

▲ **Va., Arlington** — SCHOOL — Arlington Co., Court House, bond election June 5, school constr. $4,500,000.

▲ **Va., Arlington** — COURT HOUSE — Arlington Co., Court House, bond elections June 5, court house imprvs. $2,200,000.

COMMERCIAL BUILDINGS

▲ **Ala., Huntsville**—SHOPPING CENTER, etc.—Molton, Allen & Williams, 2026 3 Ave. N., Birmingham, plans by Harry H. Hester, American Life Bldg., Birmingham, 172,500 sq. ft., shopping center and parking area. $2,000,000.

▲ **Calif., Oakland**—OFFICE, etc.—Kaiser Center, Inc., Kaiser Bldg., plans by Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, Zone 36, 25-story office and headquarters bldg., shopping center and hotel, $30,000,000-$40,000,000. CD 7/1.

▲ **Calif., Palm Springs**—SHOPPING CENTER—Desert Inn Corp., Palm Springs, plans by Victor Gruen, 135 S. Doherty St., Beverly Hills, shopping center. $4,500,000.

▲ **Calif., Redlands**—SCIENCE—University of Redlands, Redlands, plans by Smith, Powell & Morgridge, 208 W. 8 St., Los Angeles, 6 story, 45,000 sq. ft. concrete science bldg. $1,000,000.

▲ **Calif., Richmond**—RESIDENTIAL DEVELOPMENT, etc.—R. Graves & J. Moore, 959 33 Ave., Oakland, residential development and shopping center with 325,000 sq. ft. floor space, 3,000 car parking area, apartments, parks, etc. $7,000,000.

▲ **Conn., Bloomfield**—SHOPPING CENTER, etc.—Green Manor Estates, Inc., 681 Parker St., Manchester, regional shopping center, incl. Junior department store, specialty shops, parking area, Blue Hills and Wintonbury Ave. $2,500,000.

▲ **Conn., Hartford**—OFFICE—Aetna Life Insurance Co., 151 Farmington Ave., plans by Ebbets, Frid & Prentice, 862 Asylum Ave., 6 story, 132,000 sq. ft. office addn., Sigourney St. $3,500,000. A. John Macchi, 57 Farmington Ave., consult. engr. Hubbard, Lawless & Blakeley, 110 Whitney Ave., New Haven, engrs. CD 3/27.

▲ **Conn., Taftville**—CHURCH—Sacred Heart Roman Catholic Church, Providence St., church. $1,000,000.

▲ **D. C., Wash.**—SCIENCE, etc.—American University, Nebraska and Massachusetts Ave. N. W., science bldg., $1,000,000; Washington College of Law Bldg., $500,000; Fine Arts Center, $500,000. School of Business Administration, $500,000; athletic facilities, incl. field house $500,000; Construction between 1961 and 1966; Inter-faith Chapel, $350,000; Student Union Bldg. $350,000; Construction between 1956 and 1961; plans by Faulkner, Kingsbury & Stenhouse, Ring Bldg., Wash., D. C., School of International Service, $1,000,000, Work in 1957. CD 6/9/50.

▲ **Fla., Miami**—OFFICE—Boulevard Holding Co., c/o Weed-Russell-Johnson Assocs., archts., 550 Brickell Ave., 8 story steel concrete office, Biscayne Blvd. and 50 St. $2,000,000.

▲ **Ind., South Bend**—SHOPPING CENTER—Herman Light, 3000 E. Jefferson Blvd., plans by Sidney H. Morris & Assoc., 134 N. La Salle St., Chicago, Ill., shopping center between 29 and 33 Sts. $2,500,000.

▲ **Mich., Clawson**—SHOPPING CENTER—Clawson Sales Center, Abe Cherrin, et al, 18042 Ohio St., Detroit, plans by Theodore Ragvoy, 929 Fox Bldg., Detroit, Zone 1, shopping center, 20 stores, 14 Mile Rd. between Manitou and Batchewana. $1,600,000.

▲ **Mich., Southfield**—OFFICE—R. H. McManus & Co., 16100 West Eighth Mile Rd., Detroit, Zone 19, plans by O'Dell, Hewlett & Luckenbach, 950 N. Hunter Blvd., Birmingham, 7 story masonry office, 8 Mile Rd. west of Northwestern. $1,200,000.

▲ **Mich., Sterling**—HOMES, etc.—Dresden Village, Charles Goldberg, Michigan Lumber Co., 6450 W. 7 Mile Rd., Detroit, plans by Leo Pearl, c/o owner, 2,000 homes, shopping center, site development, roads, 20 Mile Rd. off Van Dyke on Canal and Clinton River, first section 500 homes. $50,000,000.

▲ **Mo., Fort Leonard Wood**—HOUSING—Contracting Officer, Fort Leonard Wood, construct and finance, 639 housing units under Title VIII. $8,626,500.

▲ **N. J., Atlantic City**—HOTEL—Childs Restaurant Division Hotel Corp. of America, c/o Kenneth LeBarr, 883 6 Ave., New York, N. Y., hotel. $5,000,000.

▲ **N. J., Atlantic City**—HOSPITAL WING—Atlantic City Hospital, 26 S. Ohio Ave., plans by Vincent G. Kling, 917 Corinthian Ave., Phila., Pa., 7 story 46x100x160 ft. bsmnt., brick, hospital wing. $2,500,000. Keast & Hood, 2031 Chestnut St., Phila., Pa., consult. engr. CD 3/8/55.

▲ **N. J., Forked River**—HOUSING—E. B. Leone, Glen Rock Lumber Co., Broadway, Fair Lawn, and John L. Clayton, Toms River, housing development, 14,200 acre tract on Lacey Rd. in Lacey Union and Ocean Twps., Ocean County near Forked River and Toms River-Lakewood area. $5,000,000.

▲ **N. J., Newark**—OFFICE, etc.—Prudential Life Insurance Co., 763 Broad St., plans by Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, N. Y., 24 story home office, 753 Broad St. $20,000,000; 7 story office, South Bldg., 763 Broad St. $3,000,000. Bids in 6-8 months. CD 1/23.

▲ **N. J., Trenton**—SHOPPING CENTER—Morris Kravitz, Lewis Tower Bldg., Phila., Pa., shopping center, 18-acre tract. $2,500,000.

▲ **N. J., Westwood**—HOSPITAL—Pascack Valley Hospital Assn., Westwood, plans by Robert Greene, Tower Hill, Tarrytown, N. Y., hospital, 23-acres on Old Hook Rd. near Emerson. $1,100,000.

▲ **N. Y., Buffalo**—HOSPITAL—Deaconess Hospital, 563 Riley St., plans by Cresap, McCormick & Paget, 342 Madison Ave., New York, hospital addn., alterations. $2,500,000. CD 12/27.

▲ **N. Y., New York**—OFFICE—Franklin Atlas Corp., 80 Wall St., Zone 5, plans by Lamb, Proskauer & Prober, 395 Pearl St., Brooklyn, Zone 1, 33 story office, on 100x175 ft. plot, Wall and Pearl Sts., to be called International Bldg. $6,000,000. To start in Feb. 1957.

▲ **O., Chesterland**—SHOPPING CENTER—Marvin Helf, Inc., 10001 Carnegie Ave., Cleveland, Zone 6, shopping center, Mayfield Rd. 1½ mi. east of Gates Mills. $1,000,000.

▲ **O., Cleveland**—STORE—Wm. Taylor Son & Co., 630 Euclid Ave., Zone 14, plans by Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, Calif., 3 story department store in Southgate Shopping Center, Maple Heights, 4,000-car parking. $5,000,000. Horn & Rhinehart, 1240 Huron St., assoc. archts.

▲ **O., Montgomery**—SHOPPING CENTER—Myers Y. Cooper Co., 2647 Erie Ave., Cincinnati, plans by J. Ward Franklin, 2647 Erie Ave., Cincinnati, shopping center, Montgomery Rd. $1,000,000.

▲ **O., Youngstown**—HOSPITAL—Youngstown Hospital Assn., Wm. J. Hitchcock, pres., Gypsy Lane and Goleta Ave., 100-bed hospital expansion for North side unit. $1,250,000. Bids early in 1957.

▲ **Pa., Folsom**—SHOPPING CENTER—Murray Realty Co., 1616 Walnut St., Phila., plans by George W. Neff, 1520 Locust St., Phila., 1 story, steel, masonry, 121,000 sq. ft. shopping center, parking area, Mac-Dade Blvd. $1,000,000.

▲ **Pa., Pittsburgh**—APARTMENT—Park Plaza, Inc., Commonwealth Bldg., plans by Wm. Simboli & Assoc., Oliver Bldg., 8 story, bsmnt., steel, brick, block apartment. $3,000,000.

▲ **Tex., Abilene**—COLLEGE BLDGS.—Abilene Christian College, Abilene, plans by Wilson, Patterson & Assocs., P. O. Box 9035, Fort Worth, Dormitory No. 1, $1,500,000; Dormitory No. 2, $1,250,000; Dormitory No. 3, $879,500; auditorium, $700,000; music center, $1,500,000; library, $750,000; boiler heating plant, $150,000; stadium, $975,000; field house, $1,350,000. CD 11/18.

▲ **Tex., Fort Worth**—OFFICE—Frank G. Bliss, 419 W. 7th St., plans by Stanley W. Bliss, 818 Littlefield Bldg., Austin, 7 story, 68,500 sq. ft. office, W. 7th between Cherry and Burnet Sts. $1,250,000.

▲ **Tex., Fort Worth**—DORMITORIES—Texas Wesleyan College, c/o Dr. Law Sone, pres., TWC Campus, two 3 story, brick, tile, concrete dormitories. $1,000,000.

▲ **Tex., Rosenberg-Richmond**—SHOPPING CENTER—Rose-Rich Shopping Center, c/o J. Gubbels, J. F. Ward and Freeman Booth, Rosenberg, plans by Golemon & Rolfe, 5100 Travis St., Houston, shopping center, Hy. 90-A. $1,000,000.

▲ **Wash., Seattle**—HOSPITAL—Missionary Sisters of the Sacred Heart, 2520 N. Lakewood St., Chicago, Ill., plans by J. Graham & Co., 1426 5 Ave., Seattle, 7 story, 56x130 ft. and 3 story, 50x120 ft., rein.-con. St. Frances Cabrini Hospital addn. Over $1,000,000. CD 1/6.

▲ **Alta., Calgary**—OFFICE—Canadian Fina Oil Ltd., Bamlett Bldg., plans by Rule, Wynn & Rule, 515 8 Ave. W., 10 story, penthouse, bsmnt., 123x150 ft., stone walls, marble trim office bldg. Over $3,500,000.

▲ **Ont., Toronto**—HOUSING—Cadillac Contg. & Developments Ltd., 366 Adelaide St. W., and Crosstown Constr. Co., 534 Lawrence Ave. W., plans by Dr. E. G. Galudi, 614 Church St., 750 unit hous-

ing, 30-unit shopping center, Sheppard Ave. between Leslie St. and Woodbine Ave. $22,500,000.

▲ Ont., Toronto—HOTEL—Golden Riviera Hotels Co. Ltd., 80 Richmond St. W., plans by Eugene Jannis, 264 Avenue Rd., 5 story with 1 story section rein.-con., concrete, masonry hotel, $1,000,000. Hooper & Volles, 111 Richmond St. W., consult. engrs. Bids in July.

▲ Ont., Windsor—COLLEGE—Redemptorist Fathers, 141 McCall St., Toronto, plans by Charles H. Gillin, 389 Queens Ave., London, college building, incl. classrooms and offices, Cousineau Rd. $1,000,000.

▲ Que., Montreal—HOUSING—S. D. Gamieroff, 1069 Notre Dame St., Lachine, plans by Ben-Ami Shulman, 5174 Cote des Neiges Rd., 50 duplexes in housing development, $1,150,000. CD 3/9.

▲ Sask., Regina—SHOPPING CENTER—McCallum-Hill & Co. Ltd., 113-117 McCallum-Hill Bldg., 20-store, shopping center. $2,500,000.

▲ Sask., Regina—SHOPPING CENTER—Principal Investments Ltd., 133 Richmond St. W., Toronto, Ont., shopping center, $2,000,000.

INDUSTRIAL BUILDINGS

▲ Iowa, Cedar Rapids—PLANT—Hubbard Milling Co., Mankato, Minn., feeder mfg. plant. $1,000,000.

▲ Mass., Boston—OFF STREET PARKING—York Realty, Inc., 180 Lincoln St., plans by Archie Riskin, 262 Washington St., 14 story, masonry, mechanical off-street parking, 27-47 Providence St., $1,000,000.

▲ Miss., Corinth—FACTORY—International Telephone & Telegraph Corp., 67 Broad St., New York 4, N. Y., 125,000 sq. ft. factory, 50-acre tract, $2,500,000. Lacy, Atherton & Davis, Hotel Sterling, Wilkes-Barre, Pa., engrs. Kellogg Switchboard & Supply Co. Div., lessee.

▲ O., Cincinnati—PLANT—Cincinnati Gear Co., Wooster Pike, plans by C. L. Baxter & Assoc., Oak St., Mariemont, 100,000 sq. ft. plant for mfr., Kenwood Rd. $1,250,000. Bids late 1956.

▲ O., Cincinnati — BOTTLING PLANT — Pepsi-Cola Bottling Co., 810 W. 5 St., plans by C. L. Baxter & Assoc., Oak St., Mariemont, bottling plant, Reading Rd., near Section Rd. $1,000,000. Bids late fall. CD 2/29.

▲ O., Cincinnati—PLANT—Weber Engineered Products, Inc., 800 Evans St., plans by A. M. Kinney, Inc., 2905 Vernon Pl., 100,000 sq. ft. plant, offices, Grooms Rd. $1,000,000. Bids late 1956.

▲ O., Salem—PLANT—Eljer Div., Murray Corp. of America, S. Ellsworth Ave., 130,000 sq. ft. plant to mfr. plumbing fixtures. $2,500,000. Swindell Dressler Corp., Aspinwall (Br. Pittsburgh), Pa., consult. engrs. CD 5/10.

▲ Okla., Duncan—REFINERY—The Sunray Mid-Continent Oil Co., 907 S. Detroit St., unit at existing refinery. $2,750,000.

▲ Okla., Tulsa—REFINERY—The Sunray Mid-Continent Oil Co., 907 S. Detroit St., unit at existing refinery. $4,000,000.

▲ Pa., Phila.—CATALYTIC REFORMING UNIT—Gulf Oil Corp., 30 St. and Penrose Ave., 26,000 b/d Catalytic Reforming Unit No. 2. $25,000,000.

▲ Tex., Andrews—SULPHUR PLANT—Phillips Chemical Co. (Subsidiary Phillips Petroleum Co.), Bartlesville, Okla., sulphur plant. $2,250,000.

▲ Tex., Port Arthur—PLANT—Gulf Oil Corp., Port Arthur, increase capacity of alkylation unit No. 1 at plant; polymerization unit from 2,500 b/d to 5,000 b/d double capacity of 70-tons daily sulphur recovery unit. $5,000,000.

▲ Alta., Edmonton—STEEL MILL EXPANSION— Premier Steel Mills Ltd., c/o United North Atlantic Securities Ltd., 507 Place d'Armes, Montreal, Que. steel mill expansion, $1,000,000. J. L. Miller, 1104 Hornby St., Vancouver, B. C., consult. engr.

▲ Man., Winnipeg—BREWERY—Shea's Winnipeg Brewery Ltd., 137 Colony St., brewery. $6,000,000.

▲ N. B., Woodstock—REFINERY—Statmat Ltd., 620 Cathcart St., Montreal, Que., manganese refinery. $20,000,000.

▲ Ont., Kingston—ROLLING PLANT—Aluminum Co. of Canada, Ltd., Sun Life Bldg., Montreal, Que., rolling plant exten. $1,750,000.

▲ Que., Montreal—PLANT—Canadian Pratt & Whitney Aircraft Co. Ltd., 150 Lorne Ave., Longueuil, plans by Percy Booth, c/o engrs., 115,000 sq. ft. plant exten. $5,000,000 equipped. T. Pringle & Son, Ltd., 4795 St. Catherine St. W., consult. engrs. CD 3/2/51.

▲ Que., Thetford Mines, etc.—MINE—National Asbestos Mines, Ltd., Thetford Mines, plans by Paul H. Lapointe, 3534 Cote des Neiges Rd., Montreal, mine development and asbestos fibre processing plant, 3,000 tons per day. $5,000,000. Giffels & Vallet of Canada, Ltd., 65 Elliott St. E., Windsor, Ont., consult. engrs. CD 3/26.

UNCLASSIFIED

▲† North Dakota—VISITOR CENTER, etc.—National Park Service, Dpt. Interior, Interior Bldg., 19 and C Sts. N. W., Wash. 25, D. C., const. visitor center and other facilities and imprvs. "Mission 66", Theodore Roosevelt Natl. Memorial Park. $2,702,000. No appropriation. CD 3/5.

▲† Pennsylvania—SPECIAL AAA FACILITIES—U. S. Eng., 925 New Federal Bldg., Pittsbugh, Zone 19, Special AAA Facilities for Pittsburgh Defense Area, at Site 37, vicinity of Pittsburgh, Sewickley Twp., Westmoreland Co., ENG-360-58-56-28. Bids Soon. CD 8/18.

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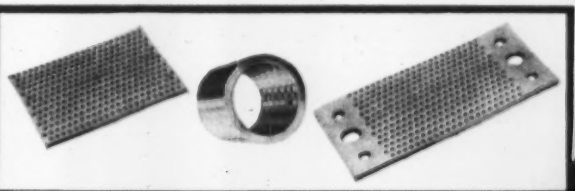

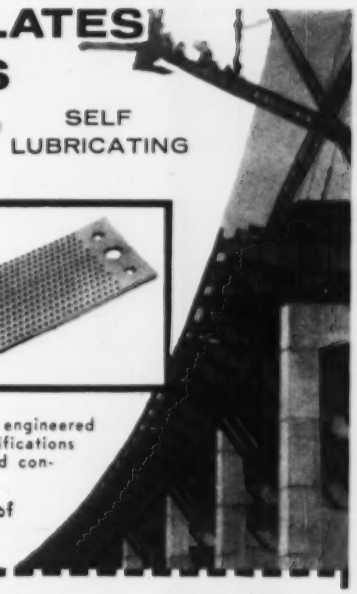

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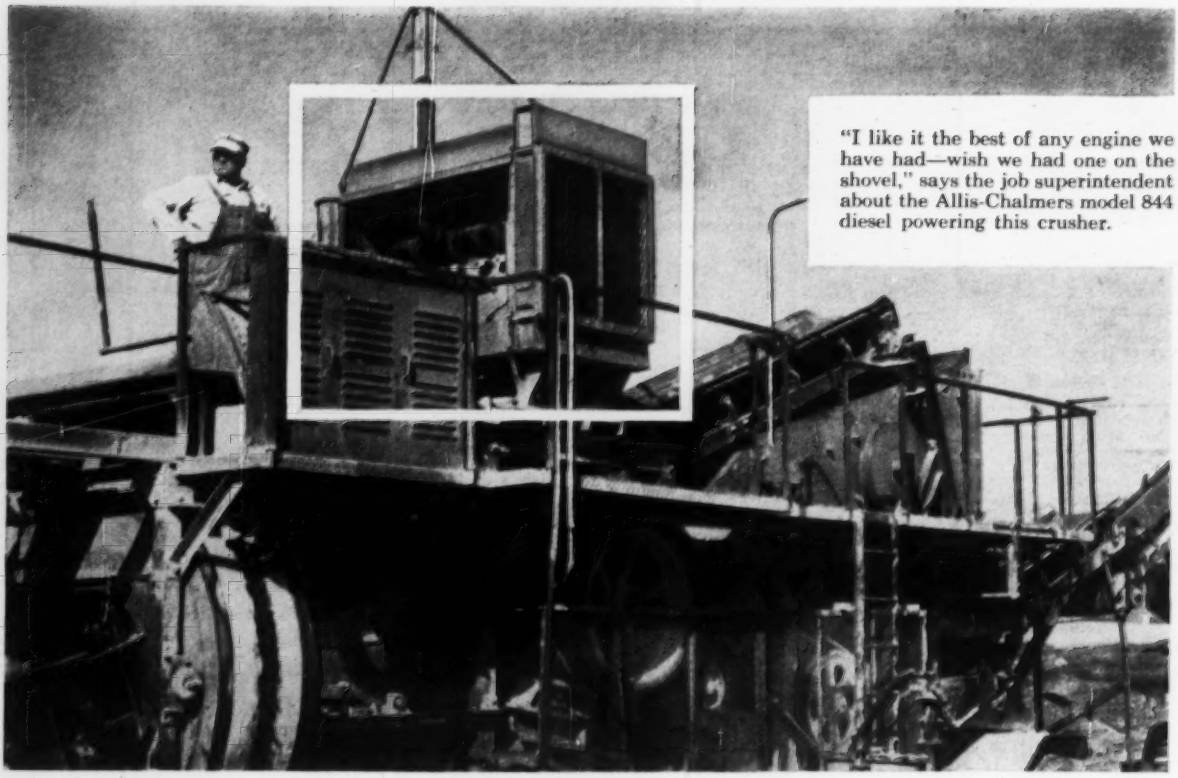

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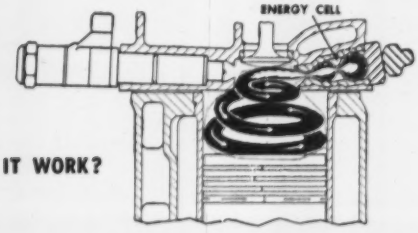

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BC-3A

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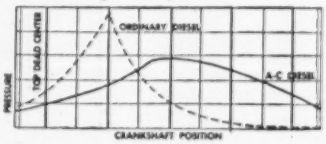

This chart compares combustion pressures at different crankshaft positions in Allis-Chalmers and ordinary diesel engines. In ordinary diesels (dotted line), pressure builds up fast, producing a hammer blow shock load while crankshaft is near dead center.

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STATE HIGHWAY LETTINGS

BRIDGES

May 28 Connecticut — May 29 Massachusetts

STREETS AND ROADS

May 28 Connecticut — May 29, 31 Massachusetts

BUILDINGS—BA

▲ **Mass., Wareham**—SCHOOL—BA 6/7—Town, high school addn., Junior High School addn., $1,000,000. Plans deposit $50, refundable. Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, archts. CD 12/18/51.

▲ **Conn., Wethersfield**—CENTRAL OFFICE—BA 6/13—State P. Wks. Dpt., 165 Capitol Ave., Hartford, Proj. CP-S-42, central office bldg. for State Hy. Dpt. and Hy. District 1 Garage. $2,000,000. Plans deposit $100. Henry F. Ludorf, 95 Elm St., Hartford, archt. CD 5/9.

BUILDINGS—LB & CA

▲ **Aberthaw Constr. Co.**, 60 State St., Boston, Mass. CA Approx. $1,500,000. FOUNDRY and OFFICE, Rustcraft Rd. and Elm St., off Rte. 128, DEDHAM, MASS. Owner, c/o Hersey Mfg. Co., Walter A. Hersey, pres., 381 E. St., South Boston, Mass. Cabot, Cabot & Forbes Co., 60 State St., Boston, Mass., engr.-archt.

▲ **A. M. Gregorio & Sons**, 14 Druid Hill Ave., Wakefield, Mass. Owner Builds. $1,000,000. RESIDENTIAL DEVELOPMENT 40 houses, "Druid Park" Vine St., WAKEFIELD, MASS.

▲ **West Hill Manor**, c/o Morgan Hickey Realty Co., High Ridge Rd., Westport, Conn. Owner Builds. $4,000,000. 150 HOUSES on 113-acre tract on West Hill Rd. near Merritt Parkway, STAMFORD, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 29 Maryland — June 5 New Jersey

June 8 Pennsylvania

STREETS AND ROADS

June 5 New Jersey — June 8 Pennsylvania

BUILDINGS—BA

▲ **N. Y., New York**—HOUSING—BA 6/4—New York City Housing Auth., 299 Broadway, Zone 7, (1) foundations and general constr., (2) heating and ventilating, (3) electrical work, (4) plumbing for Senator F. Wagner Sr. Houses (Proj. No. NY-S-24) Sect. II, incl. Bldgs. Nos. 14 to 22 (inclusive) located in area bounded generally by E. 124 St., First Ave., E. 120 St. and Second Ave. (but exclud. an area in southeast corner which is to be developed by Bd. of Educ.), Manhattan. Plans deposit $75; furnishing, erecting elevators, Plans deposit $25.

▲ **Pa., Wilkes-Barre**—INSTITUTION—BA 6/5—General State Auth., 18 and Herr Sts., Harrisburg, constr. institution for defective delinquents, incl. power plant, sewage distribution, water sys. $9,000,000. Plans deposit $100. Extended date. Alfred Hopkins Assoc., 292 Madison Ave., New York 17, N. Y. and Lacy, Atherton & Davis, Hotel Sterling, Wilkes-Barre, Pa., archts. A. F. Jones, ch. engr. CD 4/25.

▲ **Pa., Harrisburg**—NURSING HOME—BA 6/6—Dauphin County Institution District, Court House, nursing home as part of Dauphin County Hospital, just east of city, $1,300,000. Plans deposit $30. Lawrie & Green, 321 N. Front St., Harrisburg, archts. CD 3/7.

▲† **N. Y., Brookhaven**—GENERAL CONSTRUCTION—BA 6/12—Atomic Energy Comn., No. 70 Columbus Ave., New York, general construction, consisting of furnishing, all plant, power, labor, materials, tools, equipment transportation and services for Engineering Works area, Brookhaven National Laboratory, NY. 36-56, Francisco & Jacobus, 511 Fifth Ave., New York, Zone 17, engrs.-archts. CD 1/13/54.

▲ **N. Y., Cheektowaga**—SCHOOL—BA 6/13—Union Free School Dist. 2, Maryvale Dr., Buffalo, Junior High School. $2,337,000. Plans deposit $25. Foit & Baschnagel, 250 Delaware Ave., Buffalo, archts. CD 3/16.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State P. Wks. Dpt., John W. Johnson, supt., The Gov. Alfred E. Smith State Office Bldg., Albany.

John Arborio, Inc., West Cedar St., Poughkeepsie, N. Y. LB $1,641,268, est. $1,966,000. (14 bidders) 5.77 mi. Palisades Interstate Parkway, Sect. 2 and Part 1, (Rte. 59 to Rte. 45), PIP 56-2P, Rockland Co. (Correction—cost). CD 5/11, under LB.

▲ **NEW YORK**—John W. Johnson, state supt. P. Wks. Dpt., The Gov. Alfred E. Smith State Office Bldg., Albany.

N. Y.—**Horn Constr. Co., Inc.**, 2174 Hewlett Ave., Merrick, L. I., N. Y. CA $2,896,724, est. $2,930,000. (2 bidders) constr. 0.82 mi. sect. of Brooklyn-Queens Expressway between Division Ave. and Lorimer St., Kings Co.;

N. Y.—**Frank Mascali & Sons, Inc.**, 120 St. and 31 Ave., Flushing, N. Y. CA $2,879,329, est. $2,894,000. (1 bidder) constr. 0.46 mi. sect. of Brooklyn-Queens Expressway and 1.03 mi. of access roads between Bedford Ave. and Division Ave., Kings Co.;

N. Y.—**Lizza & Sons, Inc.**, 21-23 Orchard St., Oyster Bay, N. Y. CA $4,696,982, est. $5,812,000. (5 bidders) constr. 3.32 mi. sect. of Six-lane divided Horace Harding Expressway Extension and 5.86 mi. of access roads between New York City Line and Shelter Rock Rd., Nassau Co.;

N. Y.—**County Asphalt, Inc.**, 129 Main St., Tarrytown, N. Y. CA $1,435,757, est. $1,438,000 (1 bidder) reconstr. 7.66 mi. Rte. 17B starting west of Barryville Rte. 55 connection and extending eastward to Rte. 17 intersection west of Monticello, Sullivan Co.; CA $856,159, est. $955,000. (5 bidders) reconstr. 4.49 mi. sect. of Rte. 96 between Spencer and Candor, Tioga Co. Grand total $12,764,951. CD 4/13 under LB.

▲† **D. W. Winkelman Co., Inc.**, 205 Harrison St., Syracuse, N. Y. CA $2,958,529, est. $2,840,356. (2 bidders) relocating parts of Roosevelt Hy. and New York Central R. R. from Riquette River to point north of Grass River St. Lawrence Seaway, St. Lawrence River, single track railroad about 2.3 mi. long 22 ft. wide, bit. concrete paved hy. with 10 ft. shoulders from South Grass River Rd. constr. of Grass River Bridge, 1,117 ft. long consisting of 8 deck plate girder spans approx. 140 ft. long, supported on 7 piers and 2 abutments, timber deck will carry railroad in center of 22 ft. hy. with 3 ft. sidewalk on one side and 1 ft. curb on other work located near International Rapids Sect. of St. Lawrence River, 7 mi. northeast of Massena, for St. Lawrence Seaway Development Corp., CIVENG-30-23-56-28, NEW YORK, U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo 7, N. Y. CD 5/11, under LB.

▲ **Tufano Contg. Corp.**, 32-17 Lawrence St., Flushing, N. Y. CA $1,444,000. paving and utilities for International Arrival bldg. and adjacent airline wing bldgs., for New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 4/19, under LB.

▲ **Melwood Constr. Co.**, 507 Fifth Ave., New York 17, N. Y. CA $1,461,206, (8 bidders) Harlem River Drive improvement East 125 St. to Harlem River Driveway, Contr. No. 125 E, superstructure 127 Street overpass paving, parks, playgrounds, general constr. of park bldgs., E. 125 to 132 Sts., NEW YORK, N. Y. President, Manhattan Boro, Municipal Bldg., New York 7, N. Y. CD 4/10, under LB.

BUILDINGS—LB & CA

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y. CA $2,500,000. Boys' High SCHOOL between Main St., Manton St., 83 Ave. and 139 St., JAMAICA, N. Y. Marist Brothers, 153 E. 76 St., New York, N. Y. CD 3/1.

South Park Estates, c/o N. M. Obedin Co., 124 Jackson St., Hempstead, N. Y. Owner Builds. $900,000. 60 HOUSES on tract at Roosevelt Ave. and Rose St., MASSAPEQUA PARK, N. Y.

▲ **Merrick Estates Homes**, c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. $4,000,000. 2nd section, 180 HOUSES on tract at Lindenmere Dr. south of Merrick Rd., MERRICK, N. Y.

▲ **80 East End Corp.**, 332 E. 149 St., New York 51, N. Y. Owner Builds. $1,233,000. 12 story APARTMENT, 8-86 East End Ave. and 535-39 E. 85 St., NEW YORK, N. Y. CD 9/9.

▲ **Consolidated Constructors, Inc.**, 21 E. 40 St., New York, N. Y. LB $1,015,032. ELEMENTARY SCHOOL and altering existing bldg., PERU, N. Y. Peru Central School System, Peru, N. Y. Bids Apr. 26. CD 4/11.

▲ **Arthur H. Padula, Padula Constr. Co.**, 81A Mt. Vernon Pl., Newark, N. J. Owner Builds. $8,000,000. 20 story air-conditioned APARTMENT, Elizabeth and Meeker Aves. and Custer Pl., NEWARK, N. J. CD 3/9.

▲ **William Keller**, 1511 K St. N.W., Wash., D. C. CA $1,000,000. 118-unit, 8 story, reinforced brick, cinder, block APARTMENT, 825 New Hampshire St. N.W., WASH., D. C. Melvin Gleman, Investment Bldg., Wash., D. C. Berla & Abel, 2000 P St. N.W., Wash., D. C., archts.

SOUTH

BUILDINGS—BA

▲ **Va., Fort Eustis**—HOUSING—BA About 6/20—U. S. Eng., foot of Front St., Norfolk, Zone 1, construct and finance, Capehart Family Housing, 107 bldgs., 2 to 8 units each. $8,000,000. Mills, Petticord & Mills, 3308 14th St. N.W., Wash., D. C., archts. CD 1/25, under Public Buildings.

▲† **Va., Quantico**—GUADALCANAL AREA CENTRAL CAMP—BA 6/20—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., Guadalcanal Area Central Camp, Marine Corps Schools, incl. 3 story, steel, rein-conc., concrete masonry bachelor officers quarters and mess bldg. for 1,000 men; 2 story steel, rein.-conc. academic bldg., heating plant and utilities, incl. roads, walks, outside services, NOy 91991. Plans deposit $235. Lublin-MacGaughy & Assoc., 1001 Connecticut Ave. N. W., Wash., D. C., archts. CD 3/29/55.

HEAVY CONSTRUCTION—LB & CA

▲† **Blythe-Conner Co.**, 3468 Westminster Ave., Norfolk, Va., LB $1,448,400. (7 bidders) guided missiles SCHOOL and BARRACKS, Fleet Air Defense Training Center, NOy 89488, Spec. 47346, DAM NECK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 15.

▲ **American Bridge Div. of U. S. Steel Corp.**, P.O. Box 2201, Roanoke, Va., LB $1,724,644 (2 bidders) Unit II and III superstructure, Belt Line Bridge over Southern Branch, Elizabeth River, single track, 387 ft. draw span, 145 ft. lift, steel structure, NORFOLK, VA. Norfolk & Portsmouth Belt Line R.R. Co., C. M. Bell, ch. engr., Union Depot, Norfolk, Va. Bids May 15. CD 5/7.

▲ **Mountain States Constr. Co.**, South Charleston, W. Va., LB $1,300,778, Contract No. 1, interceptor sewers in Downtown and Montrose School areas, SOUTH CHARLESTON, W. VA. Sanitary Bd. of City of South Charleston, City Bldg., South Charleston, W. Va. Bids May 9. CD 4/11.

K. D. Sarrett & John S. Gillespie, Inc., 313 W. 12 St., Huntington, W. Va. LB $499,334, sanitary sewers, Contract II, Chestnut St. and Blackwell St. (South Charleston, W. Va.).

Howard Constr. Co., 2881 Immanuel Rd., Greensboro, N. C., CA $932,284. Sect. 1, 122,000 lin. ft. 2- to 12-in. water lines; Sect. 2, 200,000 lin. ft. 8- to 18-in. sewer lines, ROANOKE RAPIDS, N. C. Roanoke Rapids Sanitary Dist., Ben. E. Lancaster, supt., Roanoke Rapids, N. C. Bids May 3. CD 4/19.

▲† **Manu-Mine Research Development Co.**, Windy Hill, Angelica, Reading, Pa., LB $3,407,501, waterfront facilities, Naval Minecraft Base, NOy 94250, CHARLESTON, S. C. P. Wks. Officers, Dpt. Navy, Naval Base, Charleston, S. C. Bids May 10. CD 4/10.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee.

Powell Bros. Inc. & Heavy Constructors, Inc., Box 281, Ft. Lauderdale, Fla., CA $2,042,715 6-lane, 2,155 ft. bridge utilizing precast-prestressed concrete beams and composite I-beams on conc. piles with conc. caps, pedestal type piers on concrete piles and steel H-type piles 0.408 mi. State Rd. A-1-A, McArthur Causeway between Miami and Miami Beach, U-939-1 (5) job 8706202. Dade Co. Bids Apr. 17, awarded May 11. CD 4/23, under LB.

▲† **Diamond Constr. Co.**, Ocean Steamship Terminal, Savannah, Ga., LB $3,474,980, two offshore platforms, Navy Mine Defense Laboratory, NOy 91152, PANAMA CITY, FLA. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids May 9. CD 4/11.

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge.

W. R. Aldrich & Co., P.O. Box 1751, Baton Rouge, La. CA $969,592. grading 1.541 mi., railway and hy. underpass structures, Chippewa St., State Rte. 950-1, S.P. 817-20-05, East Baton Rouge Parish. Bids Apr. 18, awarded Apr. 25. CD 4/26, under LB.

BUILDINGS—LB & CA

▲ **A. & P. Constr. Co.**, 419 W. 22 St., Norfolk, Va. LB $1,496,612 (4 bidders) Clarke Junior HIGH SCHOOL, PORTSMOUTH, VA. Portsmouth School Bd., City Hall, Portsmouth, Va. Bids May 11. CD 4/25.

▲† **Blake Constr. Co., Inc.**, 33 E St. S.W., Wash., D. C., LB $3,048,000 (7 bidders) family HOUSING, Marine Corps Schools, NOy 92036, QUANTICO, VA., Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids May 16. CD 4/25.

▲ **Cal Kovens Constr. Corp.**, 1657 West Ave., Miami Beach, Fla., CA, $6,000,000. 5 and 7 story, 300x478 ft., rein-con., concrete block, irregular shaped swimming pool, Deauville Hotel, 6701 Collins Ave., MIAMI BEACH, FLA. Irving Pollack & Charles Kares, c/o Morris Lapidus, archt., 528 Lincoln Rd., Miami Beach, Fla. Obler & Clarke, 927-41 St. Miami Beach, Fla., engr. CD 12/27/46.

Gilson Constr. Co., 751 E. Third St., Lexington, Ky. LB $999,600 (3 bidders) Holmes Hall DORMITORY for University of Kentucky, LEXINGTON, KY. State Div. Purchases, Frankfort, Ky. Bids May 10. CD 4/19.

Rock City Constr. Co., 4401 Kentucky Ave., Nashville, Tenn., CA $845,800. constr. 2 and 3 story brick, concrete, 50-bed HOSPITAL, FRANKLIN, TENN. Williamson Co., Franklin, Tenn. Awarded May 8. CD 1/27/54.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 29 Illinois

STREETS AND ROADS

May 29 Illinois, Michigan

BUILDINGS—BA

▲ **O., Reading**—SCHOOL—BA 7/16—Bd. Educ., Bonnell St., 1 and 2 story elementary schools on east side of city on south side. $1,000,000. Plans deposit $25. Sullivan-Isaacs-Sullivan, 1800 Reading St., Reading, archts.-engrs. CD 11/9/54.

BUILDINGS—SLC

▲ **Ill., Chicago**—TEST CELLS—Ford Motor Co., P.O. Box 216, Oakland, soon lets contract Test Cells P-9 to P-12 addns., railroad tracks. $1,000,000. CD 4/24.

(Continued on page 95)

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(Continued from page 93)

HEAVY CONSTRUCTION—LB & CA

▲† **U. S. Eng.,** New Post Office Bldg., Pittsburgh, Pa., rejected bids Apr. 24, NIKE sites, Bratenahl, LB $2,887,984; Edgewater Park, LB $2,153,675, OHIO. CD 5/3, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Escanaba, Mich.—**Louis Garavaglia,** 24240 Mound Rd., Center Line, Mich. and **Pierson Contg. Co.,** 200 Eddy Bldg., Saginaw, Mich. LB $1,036,473, est. $1,000,000. (8 bidders) concrete curb and gutter 7.982 mi. from Second St. northeasterly in Ishpeming northeast and 11 ft. and 22 ft. c. conc. from Croix at northeast to one mile west of Marquette, F 52-33 C9-U (F 137 18), etc., Marquette Co.;

Mich.—**Bacco Constr. Co., Iron Mountain, Mich.** LB $758,230, est. $800,000 (12 bidders) aggregate base, prime and double seal 9.106 mi. on M-33 from Trembly to Marquette Co. line, SS 21-13 C3-R (S 854 1), Delta Co.;

Mich.—**Thornton Constr. Co.,** 1028 Ethel Ave., Hancock, Mich. LB $171,024, est. $230,000. (6 bidders) 22 and 40 ft. b. conc. 8.995 mi. M-77 from N. Blaney Park to Germfaak and 1.434 mi. stabilized aggregate base course, b. conc. surf. M-77 from US-2 north, F 75-11 C4-R (F 223 3), etc., Schoolcraft Co. Bids May 11. CD 4/24.

BUILDINGS—LB & CA

▲ **Baker & Coombs, Inc.,** 601 E. Brockway Ave., Morgantown, W. Va., LB $1,363,300 (4 bidders) DORMITORY No. 11, ATHENS, O. Ohio University, Athens, O. Bids May 8. CD 4/11.

▲ **Town Development, Inc.,** Carlton House Hotel, Pittsburgh, Pa., CA Est. $1,000,000. 29-store SHOPPING CENTER, 100,000 sq. ft. and 1,000 car parking, LORAIN, O. Pittsburgh Syndicate, Anchel Burg, 806 College Ave., Pittsburgh, Pa. Paul Kossman, Carlton House Hotel, Pittsburgh, Pa., archt. Awarded May 8. CD 1/16.

Luria Engr. Co., Eaton Ave., Bethlehem, Pa., CA, 84x520 ft. FACTORY, for warehouse and mfg. facilities for railroad cars. Total est. $750,000. YOUNGSTOWN, O. Youngstown Steel Door Co., Henricks Rd., Youngstown, O. CD 5/11, under LB;
George W. Wallstrom, Inc., 100 E. Rayen St., Youngstown, O., CA, 32x50 ft. office (Youngston, O.).

▲ **Wermuth Constr. Co.,** 1036 St. Marys St., Fort Wayne, Ind., LB $2,090,000, est. $1,500,000. (2 bidders) HIGH SCHOOL, COLUMBIA CITY, IND. Columbia City Joint High School Bldg. Corp., Columbia City, Ind. Bids May 7. CD 4/18.

▲ **Bonded Budget Bldg. Inc.,** 1747 Brodway, Gary, Ind., Own Forces, $1,400,000. 100 HOMES, GARY, IND.

▲ **Fidelity Arlington Estates,** 4214 N. Western Ave., Chicago, Ill. Own Forces. $2,500,000. 125 HOMES, ARLINGTON HEIGHTS, ILL. Seymour Weiner, 4214 N. Western Ave., Chicago, archt.

Keno Constr. Co., 3080 Skokie Valley Rd., Highland Park, Ill., CA, $831,670. (a) new JUNIOR HIGH SCHOOL, S. of Miner St. between Dryden and Arthur; (b) JUNIOR HIGH SCHOOL addn., 314 S. Highland St., ARLINGTON HEIGHTS, ILL. School Dist. 25, 301 W. South St., Arlington Heights, Ill. CD 4/25, under LB.

▲ **H. K. Ferguson Co.,** 1783 E. 11 St., Cleveland, O., CA, $17,000,000 design and construct, FACTORY, BOILER PLANT, sewage disposal unit, near AURORA, ILL. Caterpillar Tractor Co., 600 W. Washington St., East Peoria, Ill. Awarded May 7. CD 5/2.

▲ **Gallagher & Henry,** 1808 W. 82 St., Chicago, Ill. Own Forces. $1,750,000. 100 HOMES, CHICAGO, ILL. Arthur A. Gouvis, 10837 S. Michigan Ave., Chicago, Ill., archt.

▲ **S. N. Nielsen Co.,** 3059 W. Augusta Blvd., Chicago, Ill., CA, $4,939,000. Stateway Gardens, 2nd section, two 17-story APARTMENTS, 37 and State Sts., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago, Ill. CD 4/13, under LB.

▲ **Clearbrook Homes, Inc.,** 111 Albert St., Mt. Prospect, Ill., Own forces, $1,300,000. 110 HOMES, MUNDELEIN, ILL.

Fred Teitelbaum, 5526 N. Kedzie St., Chicago, Ill., CA, $650,000, multiple story, 30,000 sq. ft. DEPARTMENT STORE, Skokie and Harrison Sts., SKOKIE, ILL. Maurice L. Rothschild & Co., State and Jackson Sts., Chicago 4, Ill. A. Epstein & Sons Co., 2011 Pershing Rd., Chicago 9, Ill., archt. Awarded May 1.

▲ **American Realty Home Developers,** 333 Lake Ave., Woodstock, Ill., Own Forces, $1,800,000. 50 HOMES, WOODSTOCK, ILL. Rapp & Rapp, 230 N. Michigan Ave., Chicago 1, Ill., archts.

Immel Constr. Co., 560 N. Main St., Fond du Lac, Wis., LB $862,620 (4 bidders) general contract HOME FOR AGED, FOND DU LAC, WIS. Fond du Lac Co., Court House, Fond du Lac, Wis. Bids May 2. CD 4/12.

▲ **Rhinelander Paper Co.,** Rhinelander, Wis. Own Forces, $1,000,000. 100,000 cu. ft. bleach liquor PLANT, RHINELANDER, WIS.

▲ **Darin & Armstrong, Inc.,** 2041 Fenkell St., Detroit 38, Mich. CA $3,116,000. Contr. MH-52-A, substructure CONVENTION HALL EXHIBITION BLDG., DETROIT, MICH. City, Frank G. Schmanske, pres., Memorial Hall Comn., 151 W. Jefferson St., Detroit, Mich. Bids May 1. CD 5/8.

▲ **Herman Gundlach, Inc.,** Houghton, Mich. LB $907,885 general constr. CIVIL ENGINEERING and GEOLOGY BLDG., Michigan College of Mining & Technology, HOUGHTON, MICH. State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids May 3. CD 4/10;
Industrial Piping, Ironwood, Mich. LB $346,900. mechanical contract (Houghton, Mich.).

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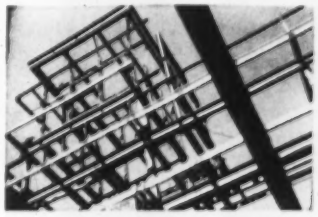

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▲ **Klipfel Northwest Assoc., Inc.**, 10101 W. Seven Mile Rd., Detroit, Mich. Owner Builds. $1,100,000. 100 brick frame HOMES, PONTIAC, MICH.

▲ **Fleeker LaBeau, Inc.**, 6922 Telegraph Rd., Dearborn, Mich. Owner Builds. $2,000,000. 125 brick HOMES, Rouge Park, RIVER ROUGE, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 1 Kansas

STREETS AND ROADS

June 1 Kansas

▲ **Texas**—BA 6/11—Angelina-Nacogdoches Counties Water Control Dist., H. J. Shands, pres. Bd. Directors, First State Bank & Trust Co., Lufkin, manufacture, construct and install following items; Contr. A, const. Stryker Creek Dam and install hoists and radial gates; Const. B, Sect. I, mfr. and furnish four radial gates for Stryker Creek Dam, Sect. II, mfr. and furnish four radial gate hoists for Stryker Creek Dam. Plans deposit $50. $1,000,000. J. M. Lloyd & Assocs., 1620 S. Sneed St., Tyler, Tex. and A. H. Washburton and Freese & Nichols, 407 Danciger Bldg., Fort Worth, engrs. CD 1/17.

† **Tex., El Paso**—GUIDED MISSILE TRAINING RANGE—BA 6/27—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., guided missile training range facilities, incl. constr. of roads, grading, concrete pads, earth revetments, 80-man barracks, shell for 1,000-man mess, operations bldg., supply bldg., missile assembly bldg., range control bldg., concrete block houses and water tank, Fort Bliss. $500,000-$1,000,000. CD 9/29, under Public Buildings.

▲† **N. M., Roswell**—BULK STORAGE, etc.—BA 6/28—U. S. Eng., Box 1538, Albuquerque, B131-000 bulk storage, Avgas; B135-000 bulk storage, jet fuel and B323-000 hydrant fueling, incl. floating roof tanks, modification of existing fuel transfer pump house, constr. 2 pump houses with underground tanks; installation of water line, fuel line, underground primary and secondary electrical distr., necessary dikes, service roads, utilities, Walker Air Force Base $1,-000,000-$5,000,000. CD 10/20.

BUILDINGS—BA

▲ **Minn., Rochester**—SCHOOL—BA 6/5—Bd. Educ., N. D. Cory, supt. Schools, R. W. Dorsett, bus. mgr.; 2 story, part bsmnt., Senior High School, $4,000,000. Plans deposit $100 general constr.; $50 plumbing and heating work, $25 electrical work. Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, Minn., archts. CD 11/5/54.

▲† **Tex., El Paso**—POST EXCHANGE, etc.—BA 6/28—U. S. Eng., P. O. Box 1538, Albuquerque, N. M., 1 story 4,000 sq. ft. branch post exchange; 6 motor repair shops; hardstands, 6 Bn. Mtr. Parks; motor park facilities, 6 Bn Mtr. Parks, Fort Bliss. $1,000,-000-$5,000,000. CD 9/29.

HEAVY CONSTRUCTION—LB & CA

▲† **W. A. Klinger Co.**, 2015 7 St., Sioux City, Iowa, CA. $1,378,494. ANG Facilities, Sioux City Air Force Base, ENG-25-066-56-81, SIOUX CITY, IOWA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 3. CD 5/8, under LB.

▲ **ARKANSAS**—State Hy. Dpt., State Capitol, Little Rock.

Ark.—**Reynolds & Williams**, 3200 Brown St., Little Rock, Ark., CA, $95,873, blacktop 12.85 mi. State Hys. 105 and 124, Russellville and Atkins, Pope Co.; CA $900,852, grav. base, c. conc. base, surf. 16.762 mi. U.S. 67, Arkadelphia-Malvern, Hot Springs Co.; LB $231,580, grav. base, 2 rein.-con. slab bridges 12.027 mi. State Hy. 84, Bismarck-Social Hill, Hot Springs Co.;

Ark.—**D. F. Jones Constr. Co., Inc.**, Rector Bldg., Little Rock, Ark., CA, $139,190, blacktop 1.521 mi. State Hy. 90, Shannon-O'Kean, Randolph Co.; LB $89,128, widening, resurf. 3.05 mi. State Hy. 63, Marked Tree-Turrell, Poinsett and Crittenden Counties;

Ark.—**Southeast Constr. Co.**, 127½ Main St., Pine Bluff, Ark., CA, $109,227, wid'n., resurf. 6.108 mi. State Hy. 270, Hot Springs-Mt. Ida, Garland Co.; CA $257,619, blacktop, 1 rein.-con. slab bridge, 9.136 mi. State Hy. 55, Fulton-Saratoga, Hempstead Co.;

Ark.—**Forcum-Lanham Constr. Co.**, Dyersburg, Tenn., CA, $94,637, blacktop 7.977 mi. State Hy. 120 O'Donnell Bend-west, Mississippi Co.;

Ark.—**Freshour Brothers**, Sweet Home, Ark., CA, $107,-264, blacktop 12.186 mi. State Hy. 31 Lonoke-Beebe, White and Lonoke Counties;

Ark.—**Ben M. Hogan & Co.**, 1100 Fairview St., Little Rock, Ark., CA, $276,298, wid'n., resurf. 10.978 mi. U.S. Hy. 65, Pine Bluff-north, Grant and Jefferson Counties;

Ark.—**Bucton Constr. Co.**, Hazen, Ark., CA, $82,603, blacktop 8 mi. State Hy. 80, Lonoke-Furlow, Lonoke Co.;

Ark.—**Lindwood Smith**, Lake Village, Ark., CA, $106,109, surf. 8.939 mi. State Hy. 4, Waterloo-Camden, Ouachita Co.;

Ark.—**Four Brothers**, Sweet Home, Ark., CA, $96,981, blacktop 9.997 mi. State Hy. 38, Hickory Plains-north, Prairie Co.;

Ark.—**Northwest Ark. Asphalt Co.**, Sulpher Springs, Ark., CA, $96,142, blacktop 11.424 mi. State Hy. 56, Brockwell-Franklin, Izard Co.;

Ark.—**Graves Brothers**, Dollarway Rd., Pine Bluff, Ark., CA, $77,222, blacktop 9.325 mi. State Hy. 48, Carthage, Farindale, Dallas Co. Bids May 9. Grand total $2,760,725. CD 5/8 and 5/1.

▲ **Eickhof Constr. Co.**, Box 477, Crookston, Minn., LB $1,747,000 (5 bidders) water treatment plant, GRAND FORKS, N. D. City, R. S. Niles, aud., Grand Forks, N. D. Bids May 3. CD 4/19.

▲† **Boyle & Lovering Co.**, 59 W. Kellogg Blvd., St. Paul, Minn., LB $1,530,577, Schedule 1, utilities and bldgs., Minot Air Force Base, Inv. 25-66-56-82, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 15;
Weitz Co., Inc., 406 Fleming Bldg., Des Moines, Iowa, LB $1,463,681, Schedule 1A (Minot, N. D.).

▲† **Iowa Bridge Co.**, 5770 2nd St., Des Moines, Iowa, LB $1,487,392, C. M. St. P. & P. R.R. relocation, Stage I, Oahe Reservoir Proj., near Mobridge, Inv. 25-066-56-111, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 15. CD 5/9.

▲ **Walter M. Mischer Co.**, 705 Holmes Rd., Houston, Tex. CA $1,275,134, sanitary sewer collection sys., Westbury area, HOUSTON, TEX. Harris County Water Control & Improv. Dist. 49, 5102 Willow Bend Blvd., Houston, Tex. Bids Apr. 14. CD 4/26, under LB.

▲ **Denver Tunnel Constructors, Inc., Colorado Constructors**, 725 W. 39 Ave., Denver, Colo., CA, $1,-590,743, est. $1,500,000. furnishing, installing tunnel lining in unlined portions of existing Moffat Water Tunnel, Tolland, DENVER, COLO. Bd. Water Comr., City & County Bldg., Denver, Colo. Bids Apr. 26, awarded May 8. CD 4/30, under LB.

BUILDINGS—LB & CA

▲ **Bd. Educ.**, 629 3 St., Des Moines, Iowa, cancelled bids to have been opened May 29, converting building into technical school, DES MOINES, IOWA. $2,400,-000. Wilff re-advertise. CD 5/3.

▲ **M. Shapiro & Sons, Inc.**, 400 Alta Dena Court, University City 5, Mo. Owner Builds. $1,000,000. one hundred and three 1 story RESIDENCES in Sect 3 of Reavis Gardens subdivision, just off Reavis Barracks Rd. near Union Rd., AFFTON (ST. LOUIS 23 P. O.) MO.

▲ **George Rich**, P.O. Box 177, Lake Okoboji, Iowa, CA, $1,000,000. RESORT DEVELOPMENT, incl. hotel, restaurant, meeting rooms, cottages, swimming pool, etc. on Lake Okoboji, OKOBOJI, IOWA. Inn Hotel Co., Robert W. Dillon, 3519 Hawthorne St., Okoboji, Iowa.

▲ **Dennehy Constr. Co.**, Braniff Bldg., Oklahoma City, Okla., CA $1,411,281. HOSPITAL addn., OKLAHOMA CITY, OKLA. St. Anthony's Hospital, 9th and Lee Sts., Oklahoma City, Okla. Bids Apr. 12. CD 4/18.

▲ **Dudley Parker & Co.**, 1509½ W. Erwin St., Tyler, Tex. CA $2,000,000. SHOPPING CENTER MAIN BLDG., BEAUMONT, TEX. Business Propertys, Inc., c/o C. D. Davis, Tyler, Tex. CD 4/25.

▲ **Herman Weber, Inc.**, 800 N. Pearl St., Beaumont, Tex. CA Est. $1,000,000. PLANT expansion, remodel existing SHOPS, BEAUMONT, TEX. Alco Products, 1400 Crockett St., Beaumont, Tex. CD 4/11.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 13, 14 California

STREETS AND ROADS

June 13, 14 California

▲ **Wash., Moses Lake**—GAS TRANSMISSION LINE—BA 6/19—City, City Hall, 44-mi. 6 in. gas transmission line from Ritzville and distr. sys. within city for natural gas, $1,750,000. Porter, Barry & Assocs., 1730 Main St., Baton Rouge, La., engrs. CD 11/9/54.

▲† **California**—BUILDINGS, etc.—BA 6/1—U. S. Eng., 180 New Montgomery St., San Francisco, 17 pre-fab buildings, 2 steel towers, 6-mi. access roads, etc., Air Force Communication Station, near Almaden, Santa Clara Co. $1,000,000.

▲† **California**—BA 6/5—U. S. Eng., 180 New Montgomery St., San Francisco, 163 ft. high, 3,500 ft. long, earth fill Coyote Valley Dam on Russian River 7 mi. northeast of Ukiah, Mendocino Co. CIVENG-56-94. $10,000,000. (Correction—name of owner) CD 5/15.

▲† **California**—BA 6/7—Bureau Reclamation, Dpt. Interior, Winters, clearing reservoir site behind Monticello Dam, Napa and Yolo Counties, $1,100,000. CD 4/20/45.

BUILDINGS—BA

▲ **Calif., San Jose**—CITY HALL—BA 6/4—City, City Hall, city hall at civic center. $1,750,000. Plans deposit $100. Extended date. CD 4/27.

▲ **Calif., Los Angeles**—HEATING PLANT—BA 6/6—Los Angeles Co., Hall of Records, central heating plant and distr. sys., Temple St. between Broadway and Hill Sts. $2,500,000. Extended date. M. A. Nishkian & Co., 3754 Long Beach Rd., Long Beach, engrs. CD 4/2.

HEAVY CONSTRUCTION—LB & CA

▲ **Kenneth Fraser Co., Inc.**, 707 S. Arroyo Parkway, Pasadena, Calif., LB $1,215,000. conversion of heating sys. at university, PROVO, UTAH. Brigham Young University, J. Tippetts, dir. of Planning, Provo, Utah. Bids Apr. 26. CD 6/8/53, under Commercial Buildings.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento,

Fredrickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., CA, $2,272,537 grading, surf. 3.4 mi. U.S. 101 in and near Santa Barbara between 0.1 mi. east of Los Olivos St. and 0.5 mi. west of El Sueno, Dr., wid'n. 1 bridge and 6 bridges for 4-lane divided freeway, Santa Barbara Co. Bids May 2, awarded May 11. CD 5/7, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., CA, $2,661,000. grading, paving 2.6 mi. 4-lane divided freeway between 0.3 mi. south of Arlington Ave., and 0.1 mi. north of 14 St. and 5 bridges Riverside Co. Bids May 3, awarded May 11. CD 5/8, under LB.

▲† **Clyde W. Woods & Sons, Inc.**, Box 602, North Hollywood, Calif., LB $1,462,710, est. $2,500,000. Los Angeles River Imprvs., Atlantic Ave. to 63 St., CIVENG-04-353-56-62, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 16. CD 5/3.

BUILDINGS—LB & CA

▲† **Ashton-Mardian Co.**, 2025 E. 22 St., Tucson, Ariz., CA, $2,233,395, CLINICAL BLDG., Veterans Administration Hospital TUCSON, ARIZ. Veterans Admin., Munitions Bldg., Wash. 25, D. C. Bids May 1. CD 5/3, under LB.

▲ **K. T. Henderson**, 1362 Colorado St., Longview, Wash., CA, $1,053,528, general contract SENIOR HIGH SCHOOL, LONGVIEW, WASH. School Dist. 122, Longview, Wash. Bids May 2. CD 5/8, under LB.

▲ **Sound Constr. & Eng.**, 1300 Aloha St., Seattle, Wash., LB $5,043,795 (7 bidders) general contract 2nd unit of TEACHING HOSPITAL, SEATTLE, WASH. University of Washington, Seattle 5, Wash. Bids May 15, CD 4/23;
W. A. Botting, Inc., 5625 University Way and **Navarre Plumbing & Heating Co.**, 3839 Stone Way, Seattle, Wash., LB $2,693,834. (3 bidders) mechanical contract (Seattle, Wash.).

▲ **Schutt Constr. Co.**, 3808 22 St., Del Paso Heights, Calif., Owner Builds, $1,800,000, 200 RENTAL UNITS, incl. park and swimming pool, FAIRFIELD, CALIF.

▲ **Jacks & Irvine Co.**, 620 Market St., San Francisco, Calif., LB $1,046,961, est. $600,000 (5 bidders) OFFICE, incl. dispatch hall and auditorium, SAN FRANCISCO, CALIF. San Francisco Bay Area Longshoremen's Memorial Assn., Pier 18, San Francisco, Calif. Bids May 9. CD 4/20.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 30 Ontario

BUILDINGS—BA

▲ **Que., Montreal**—SCHOOLS—BA 6/6—Protestant School Comrs. of Lachine, 3460 McTavish St., three 2 story, L-shaped, 238 ft. long, concrete frame, brick, blocks schools in various locations. $1,000,000. Plans deposit $50. Meadowcroft & MacKay, 4115 Sherbrooke St. W., archts.

BUILDINGS—LB & CA

▲ **Anglin-Norcross Quebec, Ltd.**, 892 Sherbrooke St. W., Montreal, Que., CA Est. over $1,000,000, (9 bidders) 8 story, 2 bsmnts., rein.-con. stone OFFICE, air conditioned, MONTREAL, QUE. Montreal Life Insurance Co., 625 Burnside Ave., Montreal, Que. Bids Apr. 20, awarded May 3. CD 4/9.

ALASKA

HEAVY CONSTRUCTION—BA

▲† **Alaska**—NIKE GUIDED MISSILE—BA 6/14—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., NIKE guided missile installations, in vicinity Elefson Air Force Base, Inv. 56-55. $4,000,000.

HEAVY CONSTRUCTION—LB & CA

▲† **ALASKA**—Alaska Road Comn., Dpt. Interior, Federal Bldg., Juneau,

W. A. Smith Contrg. Co., Inc., and Brown & Root, Inc., 1410 Fairfax Traffic Way, Kansas City, Kan., CA $1,661,332, grading, drainage, bridges on 37.519 mi. Denali Hy. Sect. B, between MacLaren and Susitna Rivers. Bids Apr. 10. CD 4/17, under LB.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—LB & CA

▲ **J. M. Tanaka, Ltd.**, Honolulu, T. H., CA $1,371,000. 3.2 mi. approach hy. to Koolau Mountain Traffic Tunnel, HONOLULU, T. H. Territorial Govt. of Hawaii, Honolulu, T. H. CD 11/20/53 under CA, under Unclassified.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **Constructora El Aguila**, P. de la Reforma, 30, Mexico City, Mexico, CA $1,440,000. military airport. SANTA LUCIA, MEXICO. Mexican Govt., Srta. de la Defensa Nacional, Mexico City, Mexico. Ing. Jose Bertran Cusseny, c/o contractor, engr. Awarded May 7. CD 10/28/48.

(Proposal Advertisements see p. 109 to 112)

"We licked a 50 year old moisture problem with FOAMGLAS roof and wall insulation"

relates Joseph D. Bradley, Production Manager, Rust Craft Greeting Cards

"Thanks to FOAMGLAS roof and wall insulation, we've licked a moisture problem that plagued us for over 50 years," relates Mr. Joseph D. Bradley, Production Manager of Rust Craft, Dedham, Mass. Producing over 300 million quality greeting cards a year demands close control of moisture content in paper stock. Lack of it could cause damaging paper losses, waste skilled man-hours and machinery time.

Rust Craft's modern plant was finished in June, 1955. Mr. Bradley says: "We designed the paper storage and the paper and film processing sections around FOAMGLAS because it's moisture-proof. In those areas we must maintain a precisely controlled temperature and humidity. These warm, moist conditions could ruin other insulations, but not FOAMGLAS. It has given us *dependable* insulating protection since installation, and we anticipate many more years of trouble-free performance.

"Since FOAMGLAS is strong and rigid, it required no structural reinforcement," states Mr. Bradley. "Because it's fireproof, we got added building protection."

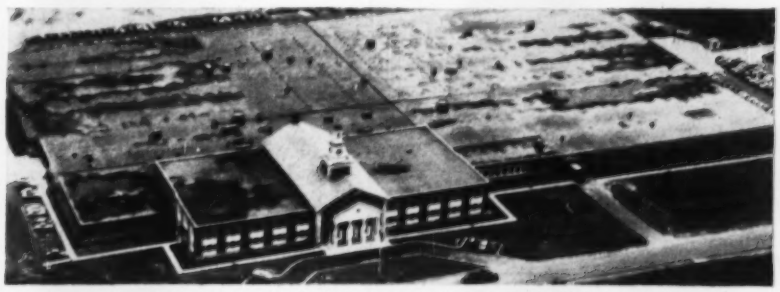
You can get all these benefits and more when you insulate your buildings, piping or equipment with FOAMGLAS. See for yourself! Write us today for a free sample and directions for six simple tests to prove that it's the ideal insulation for *your* needs. Address PITTSBURGH CORNING CORPORATION, Dept. K-56, One Gateway Center, Pittsburgh 22, Pa. (In Canada: 57 Bloor Street West, Toronto, Ontario).

FOAMGLAS®

the cellular, stay-dry insulation

Pittsburgh Corning also manufactures PC Glass Blocks

Try this test! Prove to yourself that FOAMGLAS will stay dry for years of trouble-free, constant insulating efficiency in your plant.

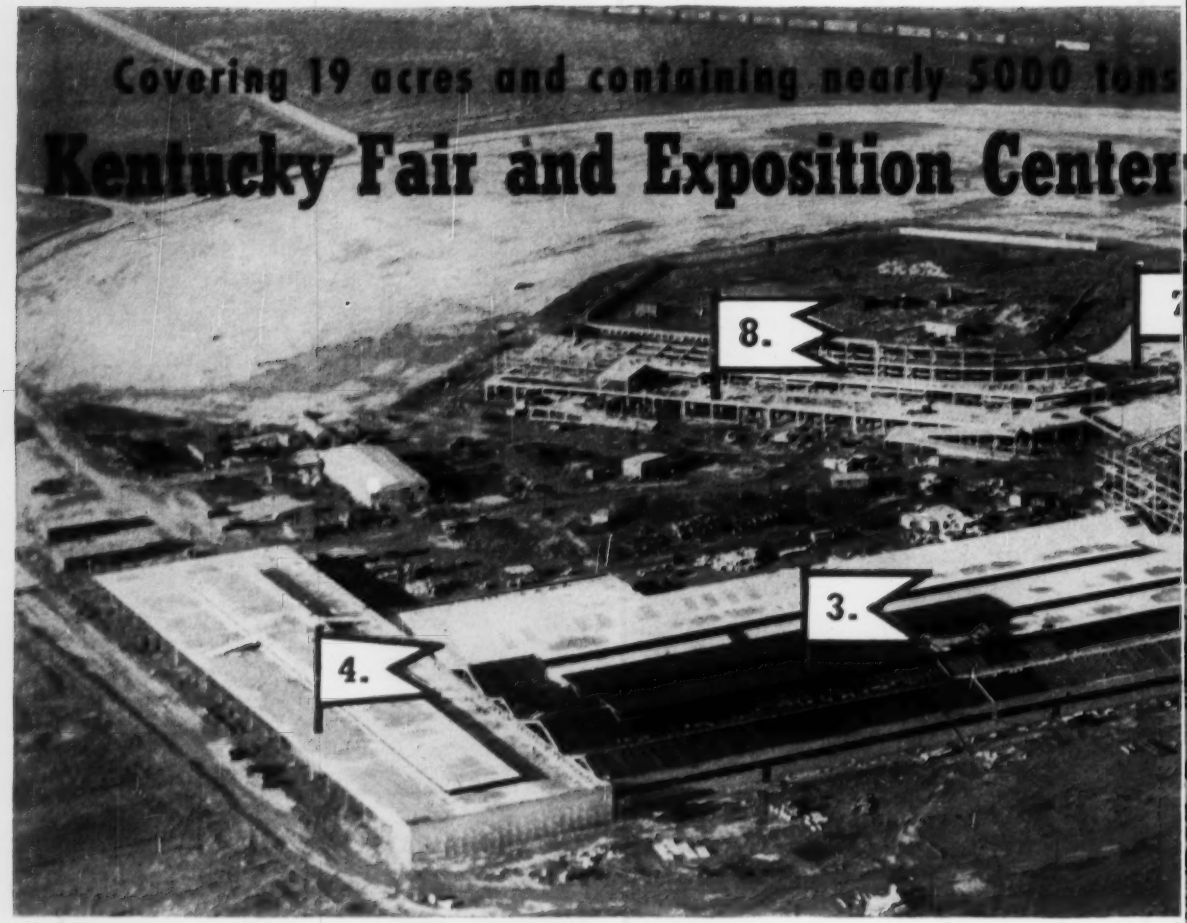


Aerial view of the modern Rust Craft plant, insulated with FOAMGLAS.

Architects-Engineers: Graham, Anderson, Probst & White, Inc., Chicago, Ill.
General Contractor: Aberthaw Construction Co., Boston, Mass.
Roofing and Wall Panel Contractor: Atlantic Roofing Co., Boston, Mass.

Covering 19 acres and containing nearly 5000 tons

Kentucky Fair and Exposition Center



IDENTIFICATION OF AREA STRUCTURES

1. **ARENA** (Coliseum) Building—295' x 468'—weight of structural steel, 2,400 tons.
2. **EXPOSITION BLDG.**—310' x 722', containing 883 tons of structural steel.
3. **LIVESTOCK PAVILION BLDG.** — 314' x 558', containing 810 tons of structural steel.
4. **SHEEP and SWINE PAVILION** — 137' x 557', containing 266 tons of structural steel.
5. **ADMINISTRATION BLDG.** — Two-story annex to Arena Bldg.—98' x 141'; weight, 166 tons.
6. **RESTAURANT BLDG.** — Two-story annex to Arena Bldg.—98' x 141'; structural weight, 140 tons.
7. **WARM-UP RING BLDG.** — 100' x 160' with 100-ft. roof trusses. Weight of steel, 87 tons.
8. **STADIUM** — Consists of 3 fan-shaped sections—277' x 277', 216' x 343', and 216' x 162', respectively. 391 tons of structural steel went into the supporting framework of this structure.

fabricated and erected by

AMERICAN BRIDGE

The Commonwealth of Kentucky is building a bigger and better Fair Grounds—one which may prove a model for other states to follow in the years ahead. As you see in the panorama above, *all* of the important buildings adjoin one another to house literally the entire Fair in a single integrated exposition area.

The largest structure in the group is the Coliseum building which is 295′ wide x 468′ long, and contains the main arena surrounded by bleachers under which are three floors. The major portion of the high arched roof is supported by ten 295′ trusses. 2,400 tons of structural steel went into this one building.

The Coliseum Building is flanked on the right by the Exposition Building, a one-story, rigid frame structure, 310′ wide x 722′ long; and on the left by the 314′ x 558′ Livestock Pavilion Building, which is also a one-story rigid frame structure.

The other buildings in the Center are listed in the column at the left. In the background is shown the partially erected Stadium which when completed will contain 391 tons of structural steel.

American Bridge is proud to have fabricated and erected the steelwork for this interesting project. If you would like to receive detailed information concerning our ability to handle your requirements, just contact the office nearest you.

Designer: **Fred Elswick & Associates, Architects and Engineers, Louisville, Ky.**
General Contractor for buildings 1 through 7: **Virginia Engineering Company, Newport News, Va.**
General Contractor for Stadium: **Robert Simmons Construction Company, Inc., Louisville, Ky.**

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION · GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

Contracting Offices in: AMBRIDGE · ATLANTA · BALTIMORE · BIRMINGHAM · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · DALLAS · DETROIT · DENVER · ELMIRA · GARY HOUSTON · LOS ANGELES · MEMPHIS · MINNEAPOLIS · NEW YORK · ORANGE, TEXAS · PHILADELPHIA · PITTSBURGH · PORTLAND, ORE. · ROANOKE · ST. LOUIS · SAN FRANCISCO · TRENTON

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

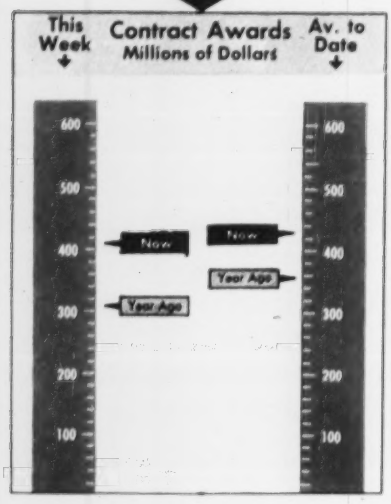
AMERICAN BRIDGE

INTERESTING MOTION PICTURES AVAILABLE—"Building for the Nations" and "The Suspension Bridge," two entertaining and educational films, are now available without charge to business, fraternal and civic organizations, churches, schools and colleges. Write to Pittsburgh office for bookings.

UNITED STATES STEEL

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 21 wks 1956	Chge %
	$ millions		
Federal	$21.9	$732.6	+4
State and Municipal	138.1	2,539.5	+25
Total Public	160.0	3,272.1	+19
Total Private	150.3	5,907.0	+23
U. S. Total	$310.3	$9,179.1	+22
By Type of Work			
Waterworks	$5.9	$120.3	+16
Sewerage	9.8	250.4	+57
Bridges	8.1	229.6	+26
Highways	69.0	952.3	+20
Earthwork, Waterways	9.5	284.2	+38
Buildings:			
Public, Excl. Housing	37.7	805.0	+21
Public Housing	5.9	152.3	+33
Private Housing	80.3	2,510.4	—10
Commercial	18.3	764.7	+17
Industrial	36.7	2,327.6	+125
Unclassified	29.1	782.3	—7
U. S. Total	$310.3	$9,179.1	+22

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

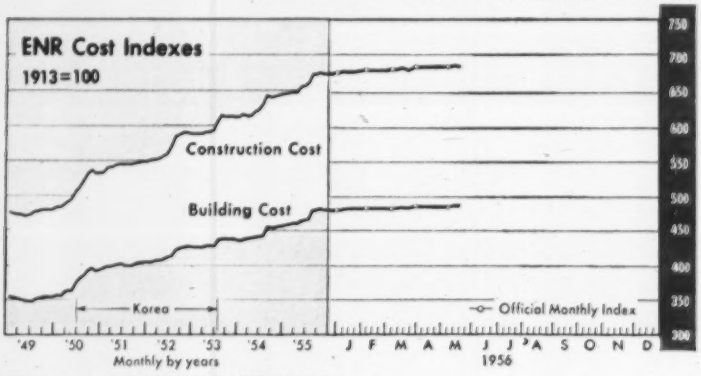
NEW CAPITAL FOR CONSTRUCTION

	Week of May 17 1956	Cum. 20 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$190.0	$1,711.0	+31
State and Municipal:			
All Except Housing	52.1	1,746.6	+13
Housing	...	20.3	—56
Federal Loans	6.0	46.5	+19
Federal Aid	...	...	100
Total Nonfederal	$248.1	$3,530.5	+16
Federal Appropriations:			
In U. S.	...	34.4	—42
Outside U. S.	...	...	...
Total New Capital	$248.1	$3,564.9	+15

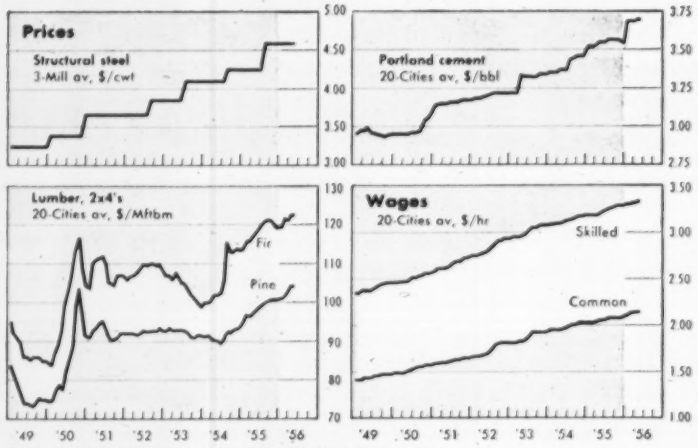
Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	May 17 1956	% Change from Apr. 19 1956	May 19 1955
Construction Cost	688.45	+0.7	+5.3
Building Cost	487.65	+0.4	+5.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.588.



ENR COST INDEX COMPONENTS

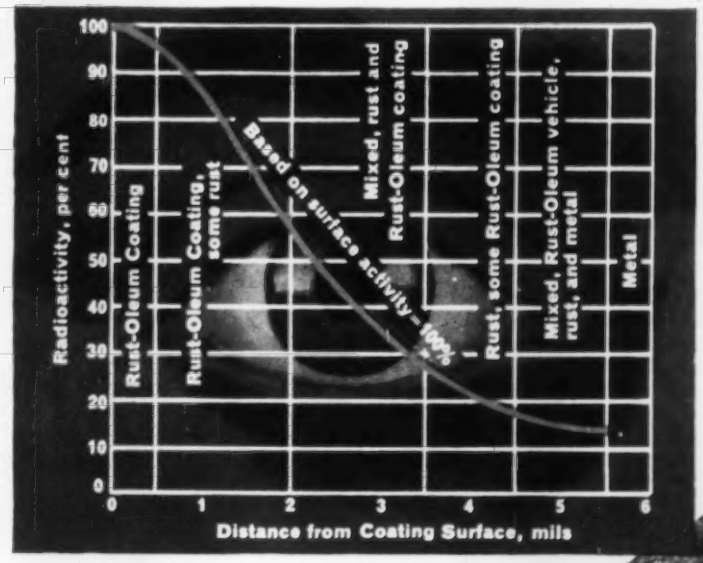


ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost May 1956	% change from Month	% change from Year	Building Cost May 1956	% change from Month	% change from Year
Atlanta	502	0	+6.2	424	0	+6.4
Baltimore	595	0	+3.4	491	+1.7	+8.7
Birmingham	549	0	+7.6	447	0	+5.5
Boston	745	+4.4	+7.5	504	+2.4	+7.7
Chicago	773	—0.1	+4.3	498	—0.1	+4.7
Cincinnati	680	+0.4	+5.1	475	+0.5	+5.2
Cleveland	793	0	+4.1	497	0	+4.6
Dallas	511	0	+4.7	426	0	+5.1
Denver	670	0	+5.5	488	0	+3.8
Detroit	780	+0.2	+2.2	507	+0.3	+5.2
Kansas City	711	—3.8	+4.4	498	—0.2	+6.3
Los Angeles	736	+2.8	+10.2	490	+0.5	+7.9
Minneapolis	741	+2.8	+3.4	510	+1.4	+2.3
New Orleans	549	0	+2.7	453	0	+3.3
New York	819	0	+9.6	556	0	+4.8
Philadelphia	722	0	+3.7	536	0	+3.0
Pittsburgh	688	0	+3.2	500	0	+2.5
St. Louis	759	0	+6.0	526	0	+7.2
San Francisco	727	+4.3	+7.6	479	+0.6	+7.7
Seattle	720	+0.2	+5.9	444	+0.2	+6.3
U.S. 20 cities' avg.	**688**	**+0.8**	**+5.4**	**487**	**+0.4**	**+5.4**
Montreal	558	+1.1	+1.8	435	+1.4	+1.6
Toronto	575	+0.5	+6.0	463	+0.6	+3.6

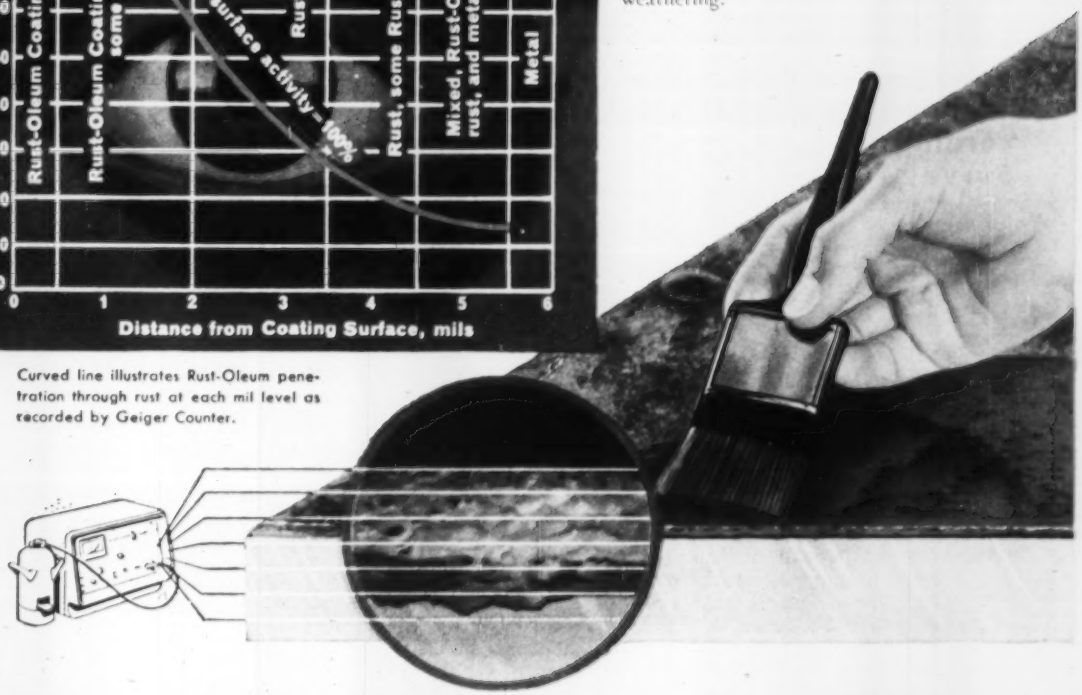
For ENR cost indexes for preceding years, see insert chart ENR Sept. 29, '55. Extra copies 50 cents.

See Rust-Oleum *penetrate rust* to bare metal through the "Eyes" of Radioactivity!



Curved line illustrates Rust-Oleum penetration through rust at each mil level as recorded by Geiger Counter.

Rust-Oleum dries to a firm, decorative coating that resists salt water, sun, fumes, heat, humidity, and weathering.

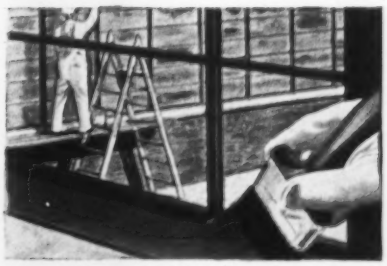


Geiger Counter traces Rust-Oleum penetration to bare metal! In nearly three years of radioactive research, Rust-Oleum's *specially-processed* fish oil vehicle was radio-activated and formulated into Rust-Oleum 769 Damp-Proof Red Primer – then applied to rusted test panels. Rust-Oleum's specially-processed fish oil vehicle was then traced through the rust to bare metal by Geiger Counter.

This penetration means rust-stopping power, because the fish oil vehicle works its way into the tiny pits in the metal where it drives out air and moisture that cause rust. Important savings are yours, because Rust-Oleum can be applied directly over sound rusted surfaces – usually eliminating costly surface preparations. Attach coupon to your business letterhead for your copy of the thirty-page report entitled, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust On Steel Specimens," prepared by Battelle Memorial Institute technologists. Prompt delivery of Rust-Oleum is assured from your nearby industrial distributor.

There is only one Rust-Oleum. It is distinctive as your own fingerprint.

RUST-OLEUM®



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Rust-Oleum is available in practically all colors, including aluminum and white. See our complete catalog in Sweets, or write for information.

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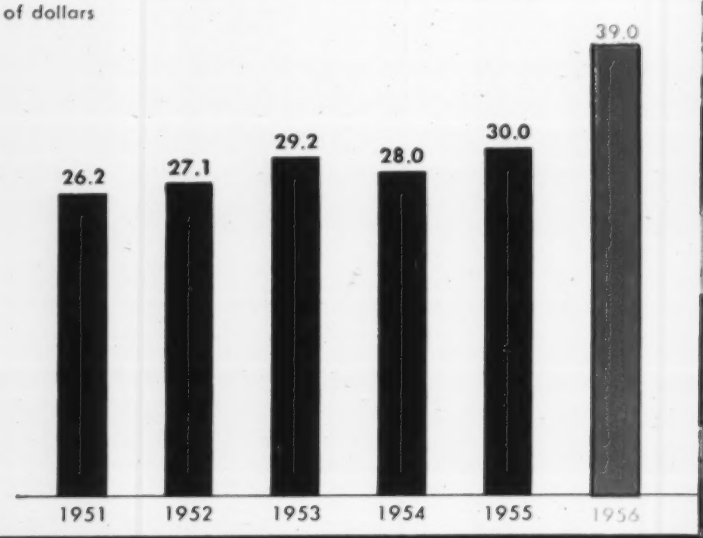
- ☐ Complete literature with color charts.
- ☐ Thirty-page report on Rust-Oleum penetration.
- ☐ Nearest source of supply.

Industrial Building Boom—Set to Roll Three More Years

Record spending for new plants and equipment — up 30% this year — will continue through '59, according to McGraw-Hill Survey.



Source: McGraw-Hill Dept. of Economics

But Shortages May Block $39-Billion

U.S. business is planning to spend almost $39 billion for new plants and equipment in 1956, an increase of 30% over 1955 capital spending. And preliminary plans for 1957 are almost equal to 1956 plans. Already, business has plans to exceed the 1955 level of spending—a record so far—in every year from 1956 through 1959.

Capital spending plans for 1956 are so large and represent such a big boost over 1955 spending that they may prove physically impossible to carry out by the end of the year. Shortages of materials and labor seem certain to slow down many projects. But whatever is not completed this year is likely to be added to spending plans for 1957, reinforcing the favorable prospects for next year.

These imposing figures on 1956-59 capital spending prospects come from the ninth annual survey of Business' Plans for New Plants and Equipment, just completed by the McGraw-Hill Department of Economics. They indicate that the recent surge in industrial building contracts—ENR's awards are running 150% ahead of a year ago—is no temporary spurt but the beginning of an industrial building boom.

The McGraw-Hill survey was taken about three months later than the February survey of the U.S. Department of Commerce and the Securities and Exchange Commission, which reported a 22% increase in business investment plans. The rise to a 30% increase reflects both a continuing high volume of new orders and some price increases for capital goods.

By major industrial sector, this year's capital spending plans shape up as follows (in millions of dollars):

	Planned 1956	% Increase Over 1955
Manufacturing	$13,998	+48
Petroleum	5,542	+11
Mining	427	+34
Railroads	1,495	+62
Other transportation & communication	4,526	+33
Utilities	4,968	+15
Commercial	8,819	+20

The largest planned increases among the manufacturing industries are in nonferrous metals (+123%), paper (+83%), steel (+82%) and automobiles (+81%). Big increases were reported also in rubber (+49%), stone, clay and glass (+42%), chemicals (+41%) and the various machinery and metalworking industries (+21% to +45%).

Auto companies will spend more than any other manufacturing industry this year ($2 billion). Next come steel ($1.6 billion) and chemicals ($1.4 billion). Reflecting the intense demand for capital equipment, the machinery industry will put over $1 billion into capital spending in one year for the first time in 1956.

The petroleum industry is planning major expansion in every phase of its operations. In 1956 the sharpest percentage rise will be in refining and transportation (pipelines), up 15% and 19% respectively.

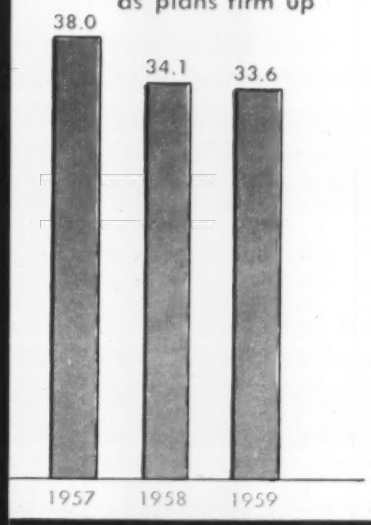
Railroads top all major industry groups in percentage increase projected for 1956. The 62% rise may not be achieved, however, because of the steel shortage.

Commercial enterprises plan to increase capital expenditures by 20% over 1955. (Most of the coverage in the McGraw-Hill survey is in retail and wholesale trade.)

An average of 29% of capital expenditures in manufacturing this year will go for construction, about the same ratio as in past years. In petroleum refining and petrochemical plants the ratio is higher, because built-in equipment is usually counted as construction. But the proportions of construction and equipment range close to the average in most other industries.

There is even better news for industrial builders and equipment producers in the preliminary capital spending plans for the years 1957-59. For the first time since the McGraw-

Huge preliminary figures will build higher as plans firm up



	1956 Spending Plans (Millions of Dollars) Total	% Change '55 '56	This much construction	Preliminary 1957 Plans Total Spending
All Manufacturing	**$13,998**	**+48**	**$4,059**	**$13,225**
Iron and Steel	1,600	+82	336	1,584
Nonferrous metals	653	+123	196	986
Machinery	1,092	+35	284	902
Construction & Mining	....	+31	....	....
Electrical Machinery	528	+21	158	544
Autos	2,041	+81	571	1,654
Transportation equipment	397	+45	139	318
Other metalworking	1,059	+45	265	973
Chemicals	1,433	+41	401	1,576
Paper	948	+83	199	891
Rubber	224	+49	29	215
Stone, Clay and Glass	706	+49	191	547
Cement	....	+113	....	....
Petroleum Refining & Chemical	810	+15	462	1,045
Food	601	+19	222	576
Beverages	201	− 6	54	188
Textile	381	+ 4	80	343
Misc. Manufacturing	1,324	+44	503	883

Capital Spending Goal

Hill surveys began, plans for a year ahead (now $38.1 billion) are just about equal to plans for the current year. And plans for 1958 and 1959 (now $34.1 billion and $33.6 billion, respectively) are already within shooting range of the current level.

Experience with previous capital expenditure surveys has shown that preliminary capital spending plans are usually revised upward as they are worked into final form. So there is a very good chance that new records will be set for capital spending each year through the rest of the 1950s.

Preliminary plans for 1957 and 1958 already call for higher capital spending than last year's level in every major industrial group and in almost every individual manufacturing industry. In several cases—including utilities, petroleum, nonferrous metals, electrical machinery and chemicals—1957 plans are now higher than the huge sums budgeted for this year.

Some relief from current shortages of construction equipment and materials is another promise held out by the new McGraw-Hill survey. Manufacturers of construction and mining machinery reported plans to step up their own capital expenditures 31% this year. And in 1959 they plan to put 45% more into plant and equipment than they did last year. Cement manufacturers expect to boost capital expenditures 113% this year, and producers of other construction materials plan to lay out 46% more than in 1955.

The basis for the big increases in capital spending this year and the extensive plans for 1957-59 is manufacturers' expectation of strong growth in sales during the years ahead. In terms of physical volume (not including any dollar increase from higher prices) manufacturers as a whole expect their sales to rise 7% this year. By 1959 they expect sales to be 24% over 1955 levels.

To meet the increased production requirements, industry is planning to boost capacity 8% this year and another 18% by the end of 1959. Most manufacturing industries will have an increase of 8% to 10% this year.

Biggest rises over the next three years are planned for chemicals (29%), nonferrous metals (28%), paper (27%), machinery (20%) and electrical machinery (19%). By the end of 1959 U.S. manufacturing capacity will be 78% higher than at the beginning of the Korean War, if present plans are carried out.

Manufacturers indicated in the McGraw-Hill survey that they need more capacity, not only to attain sales goals in future years, but also to return to efficient operating rates with present markets. As of the end of 1955, companies in 11 of 15 manufacturing industries were operating at higher average rates than they preferred for efficient production scheduling.

A high proportion of industry's investment in new plants and equipment goes to produce new products. This year's McGraw-Hill survey undertook to measure, for the first time, the impact of new products on capital spending plans.

Manufacturing companies were asked whether a significant share of their 1956 capital expenditures would be for facilities to make new products. Almost 30% of the companies answer-

The McGraw-Hill Department of Economics has conducted surveys of business' plans for new plants and equipment annually since 1948. Plans reported for the current year have come within 4% of actual business spending every year except 1950, when the Korean War prompted wholesale revision of capital spending plans.

This year's survey is based on questionnaires received during April and early May. Industrial companies reporting employ more than 7,500,000 workers, or about one-third of total employment in all industry. In commercial business, companies are carefully selected to provide a representative cross-section.

ing said yes. The highest proportions of companies putting significant capital spending this year into new product facilities were chemicals (61%), autos (50%), electrical machinery (44%).

Companies were asked also to estimate the percentages of their 1959 sales that would be in products not made in 1955 or radically changed since then. The average proportion of total 1959 sales in new products was estimated at 11%. Transportation equipment (including aircraft) and the machinery industries predicted that 18% to 20% of all their 1959 sales would be in products not made in 1955.

A solid basis for future investment in new plants and equipment emerges from other figures compiled for the first time in this year's McGraw-Hill survey. These are estimates of business plans for research and development expenditures. This is where the new products and new methods that lead to capital expenditures originate.

Business spent $3.7 billion on research and development in 1953, according to figures published last year by the National Science Foundation. The new McGraw-Hill survey indicates that industry boosted its annual research outlay to nearly $4.8 billion last year and will spend $5.5 billion this year. By 1959, yearly research and development expenditures will be over $6.3 billion, according to present plans. And if the trend of the last few years continues, this figure is likely to be raised substantially.

All in all, the new McGraw-Hill survey presents an almost unbelievably optimistic picture for industrial construction prospects over the coming four years. And, in previous years, actual capital expenditures have usually come within a few percentage points of the plans reported in these surveys.

New Plan to Woo Industry

Pennsylvania has created a new type of industrial development authority to aid establishment of new industries in the state's labor surplus areas.

The state legislature has empowered the agency to make mortgage loans to non-profit industrial development corporations for industrial building purposes. The buildings will be made available to new industries by the local development corporations through direct purchases, straight lease, or lease-purchase.

The state authority was voted an initial capitalization of $5 million under a provision that calls for a revolving fund and authorizes successive biennial appropriations.

• **No bond issues involved**—Legislation setting up the Pennsylvania Industrial Development Authority is the result of a study conducted by the State Secretary of Commerce, in cooperation with Pennsylvania industrial development organizations. This study evaluated the financing practices in other states, including Mississippi's BAWI plan, the revenue bond plans of Kentucky, Tennessee and Alabama, and the Development Credit Corporation of New England.

However, the program adopted by Pennsylvania differs from all these plans, notably by its reliance on direct appropriations from the state legislature rather than on bond issues for capital funds.

Furthermore, the Pennsylvania plan is based upon the wide experience of its own communities over the past 10 years. Since 1945 about 80 factory buildings have been built by lease-purchase or other such means through the medium of community development corporations. They have been financed primarily by a combination of voluntary local subscriptions and first mortgage loans from banks and insurance companies.

• **Easier on local interests**—But, community organizations have been reluctant to make repeated fund raising drives. Also many local banks have found it increasingly difficult to extend large enough first mortgage loans to finance these projects.

The authority's loan operations are designed to ease the burden for the community and for the lending institutions, by making second mortgage loans to the local, non-profit corporations.

While community groups have been putting up from 40% to 60% of the total construction cost of industrial buildings out of the subscription funds, the new law provides that only 20% need come from this source in cases where the authority participates in the financing.

Since the authority may make a second mortgage loan for as much as 30% of the construction cost, that loan together with the local group's 20% means that banks or other lending institutions would need to provide a first mortgage loan of only 50%.

Another provision of the bill empowers the authority to make loans to the local non-profit corporations on buildings which they have previously constructed and financed, if they are already occupied by industrial firms.

Some community industrial development organizations have their funds committed to an existing project up to 60% of total construction cost. To help them release a portion of these funds, the authority can make second mortgage loans on existing projects to reduce their participation to 20%.

Planned City

Developer uses industry as pivot in building area

The first planned city on the West Coast to make industry the pivot of development, with residential and commercial areas to be constructed according to the needs of industry's personnel, will be launched this fall when Fruehauf Trailer Company breaks ground for its $3.5-million plant in what is known as the Vina Vista sector of San Bernardino, Calif.

The planned city is the brain-child of Beverly Hills builder, Ray Hommes, now president of the Vina Vista Development Co. In conformance with his idea, master-planners, Welton Becket & Associates, have set aside about two-thirds of the land for general industry, a smaller strip for light industry, and the remaining territory for residential and commercial use.

Under the plan, a firm can call on Vina Vista to construct a plant for lease to the company, or buy the property outright, as Fruehauf has done, and erect its own facilities. Vina Vista, using its own forces will construct housing for the firm's personnel, to be sold on an individual basis to the employe.

Vina Vista is planning on an ultimate capacity of 10,000 homes. A 70-acre shopping center will be allowed to grow with the community, and is expected to be under way in about a year.

In addition to offering the advantages of a completely planned community, flanked by the Ontario International Airport on one side, and crossed by a freeway and main railway, the developers feel their arrangement will aid industry to reduce personnel turnover by offering the employe a "stake" in the community.

Extensive development of utilities and other basic facilities is now in progress—including a 4,000 gallon per hr. sewage disposal plant, and a 35,000 ft. 20 in. line off the main 30 in. New Mexico-Texas-Calif. natural gas pipeline.

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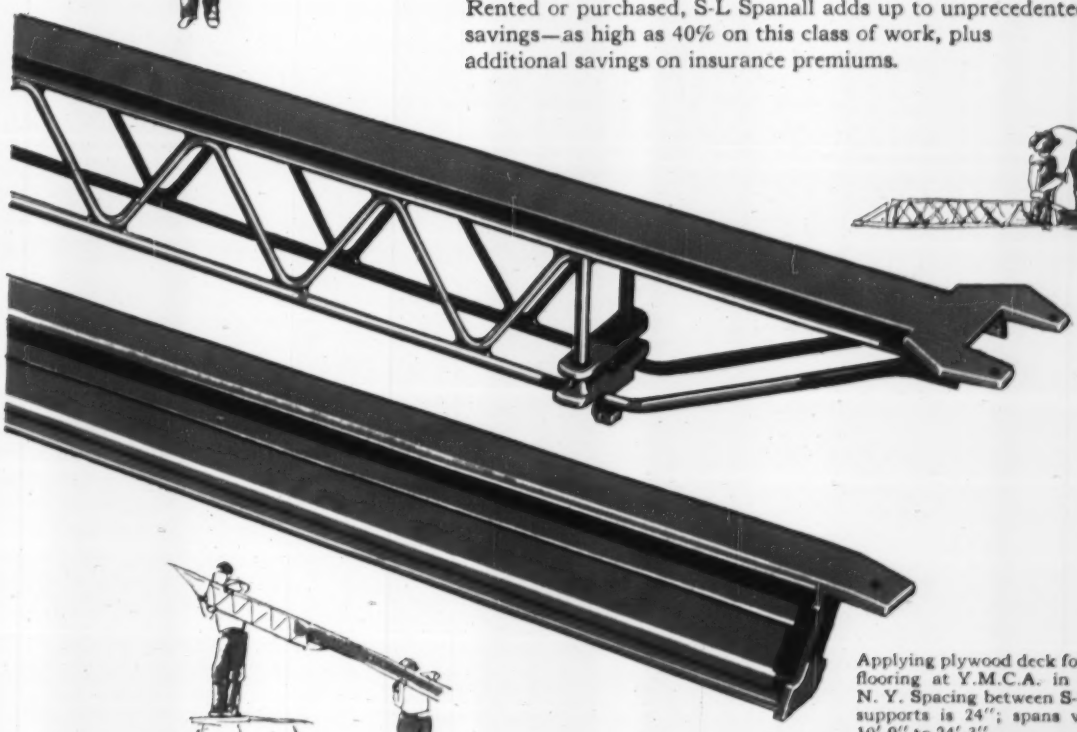

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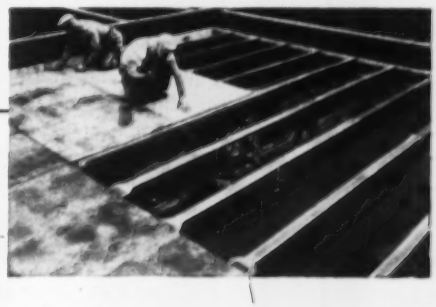

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Building trades present their case in the . . .

Jurisdictional Conflict With Industrial Unions

In the still unsettled dispute between craft and industrial unions, the AFL-CIO Building and Construction Trades Department has carefully explained its course of action, again urging its affiliates to withhold their support from mergers on the state level until a satisfactory solution to the jurisdictional conflict is reached.

In a six-page memorandum, the department has chronologically reviewed the issue, showing how it's inseparately tied to the Taft-Hartley Act, which it charges the industrial unions are using "against the building trades for the purpose of taking over our construction work jurisdiction."

The memorandum was mailed on May 12 to the presidents of all the building trades, all local and state building and construction trades councils, and all delegates who registered at the last legislative conference in Washington. It is in explanation of the action which resulted in the state merger resolution adopted by the building trades on April 26 and the subsequent censure of the unions by the AFL-CIO Executive Council (ENR May 3 and 10, p. 112, 120).

According to the memorandum, the building trades were not advised that the Executive Council was taking cognizance of the resolution and the results have never been officially communicated to the department.

• The Argument

The case presented by the building trades unfolds like this:

• Ever since NLRB General Counsel Denham acknowledged in June 1950 the inability of the NLRB to hold certification elections for the building trades, the Building and Construction Trades Department has consistently and repeatedly sought legislative relief by repeal of or amendment to the Taft-Hartley Act.

• Tied into the jurisdictional conflict are three amendments in particular that have been vigorously pushed: (1) Legalization of prehire contracts; (2) legalization of secondary boycotts against employers who are working at a common site with the employer as to whom the primary dispute exists, reversing the rule established by the Denver building trades case; and (3) repeal of the mandatory injunction provisions, so that issuance of injunctions in secondary boycott cases would be discretionary.

• Despite sympathetic consideration from President Eisenhower and various members of Congress, the building trades have encountered repeated opposition on Capitol Hill from members of industrial unions. And President Gray's efforts to obtain legislative support from the AFL-CIO have had no tangible results—not even as far as getting some priority on the hearing agenda of the Senate Labor Committee.

• In addition to effectively blocking efforts on the legislative front, industrial unions have continued to use the secondary boycott provisions of the Taft-Hartley Act to prevent the building trades from protecting their jurisdiction. In the Studebaker-Packard dispute with UAW, for example, the picket line of the building trades was not withdrawn until after secondary boycott charges had been filed.

• In pre-merger conferences the building trades were assured their jurisdiction would be protected and preserved. They unsuccessfully sought an amendment to the AFL-CIO constitution permitting them to organize and protect their jurisdiction "in all new building and construction work as well as major alterations and repairs to existing facilities." They supported formation of the permanent committee between the Building Trades and Industrial Union Departments and have unsuccessfully tried to reach a solution through the procedure set up by that machinery.

• Some Examples

Each of the charges is carefully documented and the chronological list of events spans a six-year period. The evidence is taken from Congressional testimony and from a host of union conferences, meetings and correspondence.

Here are some excerpts from the memorandum:

• ". . . The machinists want to use their plant NLRB 'production and maintenance' certification to come out on a construction job to do our construction work."

• McDonald of the steelworkers at a Congressional hearing: ". . . We regard all work done by employees of steel companies on the premises as within the scope of our contracts and our NLRB certifications . . ."

• CIO President Reuther at a House Labor Committee hearing on March 12, 1953 "voiced objection to pending bills to permit pre-hire unionshop contracts in building trades."

• "To this date the department has received no official communication as to the AFL-CIO Executive Council's action on the department's request for approval" of the Taft-Hartley aspects of its legislative program, personally presented by Gray at the council's last Miami meeting.

• "As soon as the building trades take picket action to stop an industrial union from usurping our construction work we are faced with a violation of Taft-Hartley."

• At an April 1956 meeting of AFL-CIO attorneys, called to consider the issue, "the same arguments against the building trades 'pre-hire' contract put forth by the CIO and machinists back in 1952, 1953 and 1954 were again put forth."

• "One doesn't require a crystal ball . . . to realize why the industrial unions raise objections to the building trades Taft-Hartley amendments. Boiled down, it's a question of jurisdiction. The industrial unions want plant extension construction work and the right to install what they manufacture on our construction jobs."

• President Gray in a letter to Meany on pre-hire contracts and secondary boycotts: "All we ask is that the industrial unions do not have an advantage by virtue of the provisions of the Taft-Hartley Act so as to obtain construction work which is rightfully and historically the jurisdiction of craftsmen affiliated with the building and construction trade unions."

• When the April 26 resolution came before the AFL-CIO Executive Council, "no officer of the Building Trades Department was advised of such discussion" although President Gray was sitting "two floors" below.

During the deepening of the conflict, the department has pointedly reaffirmed its desire for labor unity. But it hopes its factual account of the present situation will induce local officials to slow down the merger on the state level until the building trades are assured they won't be risking further jurisdictional losses.

(*Labor continued on page 108*)

Win Two-Year Pacts

Cleveland strike among those settled last week

Last week brought an end to the building trades' strike in Cleveland, and cleared the path for settlements in southeastern Michigan and Texas.

Fourteen of the 16 Cleveland construction unions signed two-year contracts for a 34-cent wage boost with the Building Trades Employers Association and the Home Builders Association of Greater Cleveland. An increase of 17½ cents is effective immediately and 16½ cents is deferred until next May 1.

Threat of a complete construction tie-up in Detroit was simultaneously averted as the Carpenters District Council and Local 25 of the iron workers tentatively agreed to two-year contracts.

If ratified by the 11 member locals, contracts with the AGC, Carpenters Contractors Association and Detroit Builders Association will give 14,500 carpenters in several Michigan counties a 10-cent wage boost retroactive to May 1, with another 5 cents next year, making the present rate $3.20. Other benefits include a 2% increase in vacation pay now, and a 3% employer contribution commencing next May for a pension-retirement fund.

In the Sabine area of Texas, struck since April 2, homebuilding and commercial construction was eased as carpenters in Port Arthur, Beaumont and Orange agreed to two-year contracts, providing for 15 cents now and 10 cents next year—a formula also acceptable to Port Arthur painters. And the AGC agreed to go along with operating engineers on commercial building projects with a one-year contract.

Search for Members

Painters union to recruit among industrial workers

The industrial field is where the painters union must concentrate its efforts to enroll new members, according to L. M. Raftery, general president of the Brotherhood of Painters, Decorators and Paperhangers.

In an article in the current issue of "The Painter and Decorator," Raftery makes no reference to the unresolved conflict between the building trades and industrial unions (ENR May 10, p. 120), but he notes that the AFL-CIO theory of equality between craft and industrial unions "clashes vigorously with the realities of life once you begin organizing the 37,000,000 unorganized workers in the United States."

The painters' president says there are "innumerable nonunion industries as well as unorganized subsidiaries of larger corporations employing a considerable number of maintenance painters. Also there are thousands of unorganized employes of our federal, state, county and city governments, utilizing their limited skills as painters on government owned buildings, equipment, highway construction and maintenance, etc., who would welcome the benefits to be derived by affiliating with our Brotherhood."

A parallel problem, noted by Raftery elsewhere in the same issue, is "intelligent application" of the union's apprentice training program so that union painters will not "be engineered out of" various industrial facilities. With the growth of automation and technological innovation, he says, today's entire industrial plant has become "a highly technical installation, from the grade beam to the entire color dynamic paint job on its gleaming interior," leaving little room "in our industry of tomorrow for the so-called average mechanic."

The AFL-CIO's most challenging task—organization of the unorganized—must start, according to Raftery, with the exposure of nonunion workers to the "message of democratic unionism."

Fringe Benefits: Costs Still Unknown

Employers have a challenging amount of spadework to do in the field of fringe benefits before they can know where they stand on labor costs when it comes to collective bargaining.

Last week, a representative of the U. S. Department of Labor told the collective bargaining conference of the American Management Association in Chicago that there is no generally acceptable definition of fringe benefits and no uniform method as to computing their costs. Unions, which generally think in terms of the prevalence of specific benefits, with considerable justification, tend to have little faith in employers cost statistics.

• **Scope of the problem**—According to Nelson M. Bortz, acting chief of the Bureau of Labor Statistics' Division of Wages and Industrial Relations, "package-type" settlements have become widespread, with two out of every three large contracts negotiated in the last two years containing one or more types of wage supplements. Such benefits have become an integral part of our wage structure and are items on which employers are now legally obligated to bargain.

On most of them the employers foot the bill—yet no one knows the aggregate amounts involved, Bortz said. According to his analysis, the root of the problem is that "no clear, common, or uniform concepts exist either in management or union circles as to the items that should appropriately be included in any examination of employer expenditures."

On the long list of possible inclusions are such items as overtime, vacation and holiday pay, and pension and health and welfare contributions that may result from collective bargaining; unemployment compensation charges paid for entirely by the employer; and social security payments shared equally by the employer and the employe.

• **Some of the questions**—Efforts to classify benefits as a basis for computing costs, Bortz said, give rise to a host of questions. Should payments legally required by law be classifiable as fringe benefits? Should a distinction be made as to payments for time worked, such as overtime and shift differentials, that are scheduled for the convenience of management?

It was noted that unions often take the view that, while fringe benefits may be labor costs, not all such costs are fringe benefits; many of the expenditures yield compensating gains for employers and the net cost is less than the expenditures.

Bortz indicated that employers are inclined to distinguish between time paid for and worked, and pay for time not worked. Some have suggested as a test whether the employer is free to discontinue the item of expense. Many recognize that a number of wage supplements should not be attributable to the results of wage negotiations.

Exploratory efforts have been undertaken by the Bureau of Labor Statistics to size up the fringe benefit problem and to determine the extent to which such expenditures can be measured. It reports a widespread interest among employers to assist it in the task, and hopes to develop "reasonably accurate data" of use to employers, unions and others who want a "factual analysis of the real dimensions of wage supplements."

ESA Gains Representation In Four More Western Firms

Employees of four materials and soils testing laboratories in the San Francisco Bay area have voted for representation by Engineers and Scientists of California, an affiliate of Engineers and Scientists of America.

Efforts to obtain representation through a National Labor Relations Board election have been underway for over a year. Both ESC-ESA and the Consulting Engineers Association of California agreed to a consent election, after a change in the NLRB jurisdictional standards permitted putting the issue to a vote. Local 3 of the AFL-CIO operating engineers, which tried to obtain recognition from employers last summer (ENR June 23, 1955, p. 80), did not intervene.

Of the 103 employees eligible to vote, 67 voted for ESC-ESA; 6 voted for no representation. The professionals, in a separate Sec. 9(b) vote, favored a single bargaining unit with technical employees by a margin of better than 2 to 1.

The four employers concerned are Woodward, Clyde and Associates, Oakland; Hersey Inspection Bureau, Oakland; Hales' Testing Laboratory; Emmeryville; and Abbot A. Hanks, San Francisco.

Contractor Seeks Damages In Strike at Hanford Works

Last week saw the first break—and the first damage suit—in a six-week-old strike of construction workers at the Hanford Atomic Energy Project near Richland, Wash.

Two small contractors signed agreements granting in-project travel allowances to the three striking unions—teamsters, operating engineers and cement masons—and Morrison-Knudsen Co. filed a million-dollar suit against the teamsters and operating engineers.

The strike was called on April 1, after the workers had been taken out from under the project agreement, that had been terminated as work neared completion, and put under existing AGC area contracts. The dispute is over time spent in travel to and from job sites on the reservation.

The two new contracts guarantee bus transportation for workers to and from jobs on the reservation and allows 10 cents a mile to workers using their own cars.

Morrison-Knudsen, which charges violation of a no-strike clause in the AGC contract, is asking for $638,000 in general damages plus $13,000 daily for the duration of the strike.

OFFICIAL PROPOSALS

Bids: June 7, 1956

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on June 7, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES IN INTERSTATE ROUTE 1, SECTIONS 7B & 7C TOWNSHIPS OF PLATTSBURG, BEEKMANTOWN, AND CHAZY, CITY OF PLATTSBURG, CLINTON COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-87

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. W. C. Bassette, Acting Dist. Engr., 444 Van Duzee Street, Watertown, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $38,350.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,920. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 6, 1956

Commonwealth of Puerto Rico Department of Public Works

NORTH EXPRESSWAY PUMPING STATION
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May 21, 1956

The Board of Awards of the Department of Public Works of Puerto Rico will receive sealed proposals for the furnishing of equipment for and constructing the North Expressway Pumping Station, Municipality of San Juan, Puerto Rico.

Bidders shall submit their proposals at the office of the Board of Awards in the Department of Public Works until 2:00 P. M. (Puerto Rico time) on July 6, 1956 at which time and place said proposals will be publicly opened and read aloud.

The work to be performed is divided into four (4) sections under which the work is classified according to its character. The principal items of work are as follows:

Section A—Furnishing and delivering C.I.F. San Juan, Puerto Rico, four (4), five (5) or six (6) electric motor driven drainage pumping units, one (1) of fifty thousand (50,000) gallons per minute capacity and three (3), four (4) or five (5) of one hundred thousand (100,000) gallons per minute capacity, complete with their motors, mechanisms and appurtenances, together with the services of an expert to supervise the installation and testing of the equipment.
Section B—Furnishing and delivering C.I.F. San Juan, Puerto Rico, one (1) thirty (30) tons capacity gantry crane with one (1) two (2) ton capacity auxiliary hoist, having a span of six (6.0) meters center-to-center of rails and a maximum lift of seven (7) meters above the tops of rails, together with the services of an expert to supervise the installation and testing of the equipment.
Section C—Constructing the North Expressway Pumping Station including receiving and suction well, superstructure, outside connecting piping, roadways and paths, grading, fencing, miscellaneous structures and appurtenances and the installation of pumping equipment and the gantry crane furnished by others.
Section D—Furnishing and installing all electrical equipment, wiring and controls required for the North Expressway Pumping Station including switchgear, switchboards, controls, conduit, wiring, connections and accessories.

Copies of the plans, specifications and instructions to bidders may be examined without charge at the office of the Procurement and Contracts Division of the Department of Public Works or at the offices of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, N. Y. Copies thereof may be obtained at the office of the Procurement and Contracts Division of the Department of Public Works or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, N. Y. upon a deposit of TWENTY ($20.00) DOLLARS in cash, money order or certified check payable to the Secretary of the Treasury until one (1) week prior to the opening of bids. The full amount of the deposit will be refunded to each depositor upon the return of the plans in good condition within twenty (20) days after the opening of bids.

Each proposal must be accompanied by a provisional bond in the amount set forth below in any of the forms indicated in the instructions to bidders:

Section A—EIGHT THOUSAND ($8,000.00 DOLLARS
Section B—ONE THOUSAND ($1,000.00) DOLLARS
Section C—THIRTEEN THOUSAND ($13,000.00) DOLLARS
Section D—TWO THOUSAND ($2,000.00) DOLLARS

The Board of Awards reserves the right to accept any bid or to reject any or all bids and to award any contract under the conditions found most favorable to the Commonwealth of Puerto Rico.

BUCK, SEIFERT AND JOST
Consulting Engineers

ROBERTO SANCHEZ VILELLA
Secretary of Public Works

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 16C-4700) will be received at Winters, California, until June 21, 1956, for furnishing labor and materials for Earthwork, Concrete Pipe Lines and Structures, Laterals 5.3, 14.0, 36.6 and Y-2.6, Contra Costa Canal Distribution System, Central Valley Project, California. Location near Antioch, California. Principal items are 16,700 cu. yds. excavation; 25,460 lin. ft. furnishing and laying precast concrete pipe lines, diameters vary from 12- to 30-inches with heads varying from 50- to 150-feet; furnishing and installing venturi meter, gate valves, line meters and metalwork; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, P. O. Box 546, Winters, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 16C-4701) will be received at Oak View, California, until June 21, 1956, for furnishing labor and materials for Casitas Dam, Ventura River Project, California. Location near Ventura, California. Principal items are 8,800,000 cu. yds. excavation; 9,000,000 cu. yds. embankment; 14,300 cu. yds. concrete; and other work. Completion time 3-0 days. For particulars, address Bureau of Reclamation, 655 Santa Ana Street, Oak View, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: June 7, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany, N. Y.						
Albany	Ch. 103/11-45 #2 Ch. 52/10-55	County Assistant's Office and Garage at Voorheesville	....	Asp. Conc., Opt., Grading, Paving & Misc. Work	$1,800 Plans $10	$33,000
Saratoga	Ch. 103/11-45 #3 Ch. 52/10-55	County Assistant's Office and Garage at Saratoga	....	Asp. Conc., Opt., Grading, Paving & Misc. Work	$3,300 Plans $10	59,000
Albany	R.C. 56-32	Loudon Pt. 2, S.H. 119 Loudon-Crescent, S.H. 5555 Loudon-Crescent Pt. 2, S.H. 5614	6.43	Asp. Conc., Opt.	$13,500 Plans $10	251,000
Greene & Ulster	FASSH 56-10 FARC 56-82	Phoenicia-Stony Clove, Pt. 1, Hwy. No. 214-2-1 Phoenicia-Kaaterskill Junction, S.H. 9048 Project S-937(4)	3.98	Bit. Mac. Pen. Meth., Ty. 1; 2 R.C. Closed Box Brs. 22.6' and 28.3', Comp. I-Beam Br. 42'	$45,000 Plans $25	815,000
Rensselaer	R.C. 56-33	Cropseyville-Grafton, S.H. 5222 Grafton-Petersburg, S.H. 5478	3.93	Asp. Conc., Opt.	$7,000 Plans $10	135,000
DISTRICT No. 2, LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, N. Y.						
Madison & Oneida	FASH 56-2	Oneida-South Bay, Pt. 1, S.H. 1110	1.04	9" Cem. Conc. Pavt. 24' Wide Comp. I-Beam Br. 161'	$25,000 Plans $15	450,000
Oneida	FARC 56-34	City of Oneida: North-South Arterial Connection Project US-458(1)				
Oneida	FAC 56-5 FAGC 56-6	City of Utica: North-South Arterial Route (Oriskany Street West-Riverside Drive) Project U-UG-752(6)	1.20 (0.55) (Acc.)	9" Cem. Conc. Pavt. Var. Wide = 0.51 Mi.; Asp. Conc., Ty. 1A = 1.15 Mi.; Misc. Work = 0.09 Mi.; 2 RR. Sep. Comp. I-Beams 493.2' and 556.9'; 1 Hy. Sep. Comp. I-Beam 240.3'; 1 Br. Comp. I-Beam & Plate Girder 298'	$250,000 Plans $50	4,527,000
DISTRICT No. 3, WILLIAM ROBINSON, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Tompkins	R.C. 56-29	Taughannock State Park-Ithaca, S.H. 1921	5.25	Asp. Conc., Type 1A	$13,000 Plans $10	237,000
Tompkins	R.C. 56-30	Ithaca-Danby, Pts. 1 & 2, S.H. 5043-5122	5.83	Asp. Conc., Type 1A	$12,000 Plans $10	233,000
DISTRICT No. 4, B. F. PERRY, Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FAC 56-3	City of Rochester: Inner Loop (South Ave. to George St.) Project U-UG-231(9)	0.54 (2.04) (Acc.)	Asp. Conc., Type 2A; 3 Hy. Seps. Comp. I-Beams; 101.5', 119.9' and 131.5'; 1 RR Sep. Comp. I-Beam 174.8'	$160,000 Plans $100	2,939,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court St., Buffalo, N. Y.						
Erie	R.C. 56-31	Depew Village, S.H. 916 Genesee Street, Pt. 1, S.H. 1212	4.43	Asp. Conc., Type 2A	$20,000 Plans $10	361,000
Erie	R.C. 56-35	Main Street, Pt. 1, S.H. 69	3.13	Asp. Conc., Type 2A	$19,000 Plans $10	354,000
Erie	R.C. 56-36	Sheridan Drive, S.H. 9216	6.83	Asp. Conc., Type 2A = 6.80 Mi. Misc. Work = 0.03 Mi.	$30,000 Plans $10	546,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, 30 W. Main St., Hornell, N. Y.						
Steuben	FASS 56-4	Webbs Crossing Road, CR #66 Project S-447(1)	0.26	Asp. Conc., Opt. Comp. I-Beam Br. 115'	$8,000 Plans $10	152,000
DISTRICT No. 7, W. C. BASSETTE, Acting District Engineer, 444 Van Duzee Street, Watertown, N. Y.						
Jefferson	FAC 56-4	City of Watertown: Bradley Street Project U-745(3)	0.86	Asp. Conc., Opt. = 0.84 Mi.; Misc. Work = 0.02 Mi.; R.C. Twin Box Br. 30'	$19,000 Plans $15	353,000
DISTRICT No. 8, KURT G. RAUER, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Dutchess	TSP RC56-3	Taconic State Parkway, Sect. 3 and 4 (Incl. Shenandoah Gas Sta. Area)	3.49	Asp. Conc., Opt.	$4,500 Plans $10	80,000
Rockland	R.C. 56-27	Tompkins Cove-West Haverstraw, S.H. 8049	0.18	Cem. Conc. Sidewalks and Curbs	$550 Plans $10	10,000
Orange & Sullivan	FARC 56-80	Bloomingburg-Monticello, Pt. 1, S.H. 5510-5510A Middletown-Bloomingburg, S.H. 5210-5210A-5210B Goshen-Fair Oaks, Pt. 3, S.H. 47-11 Bloomingburg-Bullville, S.H. 8166 Project F-495(9)	6.63 (4.44) (Acc.)	9" Cem. Conc. Pavt. 2 @ 25' Wide = 7.99 Mi.; Asp. Conc., Opt. = 2.67 Mi.; Fdtn. Crse. Grav. = 0.25 Mi.; Treated Gravel = 0.08 Mi.; Misc. Work = 0.08 Mi.; 5 Hy. Seps. Comp. I-Beams 175.1', 267.5', 127.9', 114.6' and 227'; 1 Br. Comp. I-Beam 158'	$400,000 Plans $100	7,371,000
District No. 9, F. J. WEBER, Acting District Engineer, 71 Frederick Street, Binghamton, N. Y.						
Broome	FASS 56-3	Deposit-Oquago Lake Project S-269(1)	0.07	Asp. Conc., Opt. Comp. I-Beam Br. 109'	$7,000 Plans $10	131,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., N. Y.						
Bronx	FAMDE 56-1	Major Deegan Expressway and Extension, Cont. 18 Project U-1082(22)	7.33	Landscaping and Misc. Work	$18,000 Plans $15	324,000
Bronx	FANETC 56-3	New York State Thruway-New England Section, Cont. #4 (Hutchinson River Pkwy.-Westchester Ave.); Bronx-Pelham Pkwy. and Access Roads Project IN-1068(11)	0.91 (3.59) (Acc.)	9" Cem. Conc. Pavt. 2 @ 36' & Var. Wide = 2.94 Mi.; Misc. Work = 1.56 Mi.; Hy. Sep. Comp. I-Beam 205'; RR. Sep. Plate Girder 346.1'	$250,000 Plans $100	4,512,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUP'T. OF PUBLIC WORKS

Read the Official Proposal Columns of

ENGINEERING NEWS-RECORD

This Week and Every Week

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: June 7, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 9, Jos. C. Frederick, District Engineer, 71 Frederick Street, Binghamton 21F, N. Y.						
Delaware	FARC 56-17 R.C. 56-18	Andes-Margaretville, S.H. 8017 Margaretville-Halcottaville, S.H. 5384 Project S-459(1)	0.48	9" Cem. Conc. Pavt. 32'–40' Wide = 0.36 Mi. Asph. Conc., Opt. = 0.09 Mi. Misc. Work = 0.03 Mi.	$19,000 Plans $15	$335,000
DISTRICT No. 10, M. E. Gould, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.						
Bronx	FICBE 56-1	Cross Bronx Expressway Contract 7 (Fulton Ave. to Longfellow Ave.) Project IN-1084(23)	1.00 (1.84) (Acc.)	9" Cem. Conc. Pavt. with Carbon Black 2 @ 36' Wide = 0.82 Mi. Misc. Work = 0.18 Mi. (Acc. Rd. Cem. Conc. Pavt. = 0.28 Mi.) (Acc. Rd. Sheet Asph. = 1.56 Mi.) 4 Hy. Segs. Rig. Frames, 98', 84.5', 99', & 99' 1 Hy. Seg. R.C. Arch 110.4' 1 Hy. Seg. Steel Girder 116.4'	$520,000 Plans $100	9,520,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: June 19, 1956

Contract EXD-130.025

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUILDING
FOURTH FLOOR ALTERATIONS

Sealed proposals for alterations to the Fourth Floor of the Port Authority Building at 111 Eighth Avenue, New York 11, N. Y., will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 19, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 24, 1956

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4698) will be received at Ephrata, Washington, until June 19, 1956, for furnishing labor and materials for Frenchman Springs Pumping Plant, Approach Lateral W53.1 and Discharge Lines, Block 79, Columbia Basin Project, Washington. Location near Quincy, Washington. Principal items are 130,100 cu. yds. excavation; 1,730 cu. yds. concrete; 5,360 lin. ft. furnishing and laying concrete pipe; 90,000 pounds furnishing and erecting steel for pumping plant superstructure; 53,200 pounds installing steel discharge pipes and drains; installing 8 main motor-driven horizontal centrifugal type pumping units; and other work. Completion time 520 days. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

United States Department of Commerce, Bureau of Public Roads, May 10, 1956. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Administration Bldg., Washington 25, D. C. until 2 p.m., e.d.t., June 14, 1956 for the construction of approximately 21 miles of grading, drainage, and selected borrow base on the Inter-American Highway in Honduras between Jicaral Galan and the Nicaragua border. Bidders will be limited to United States or Honduras firms with a satisfactory record of performance on construction in the United States or in the Republic of Honduras. The approximate quantities of the major items of work are: Unclassified excavation 362,000 cu. meters, Unclassified borrow 224,000 cu. meters, Selected borrow base course 120,000 cu. meters, Class "A" concrete in box culverts, 1,360 cu. yards, Reinforcing steel in box culverts 155,000 lbs., Nestable bituminous coated corrugated metal pipe culvert 6250 feet (24" to 60"). All materials, equipment and supplies used in the construction of this project must be products of the United States or of Honduras unless otherwise authorized. Bureau of Public Roads Specifications FP-41 will apply. Plans, Specifications, and Proposal Forms are available upon request at the above address, or at the Inter-American Highway District Office, Bureau of Public Roads, Room 212, Banco Atlantida Bldg., Calle Colon, Tegucigalpa, Honduras, mailing address Apartado 165. C. D. Curtiss, Commissioner.

OFFICIAL PROPOSALS

Bids: June 12, 1956

Contract LGA-280.001

THE PORT OF NEW YORK AUTHORITY
SPRINKLER AND FIRE ALARM SYSTEMS
HANGER NO. 7 AND BUILDING NO. 22

Sealed proposals for alterations to the existing sprinkler system in Hangar No. 7 and the installation of a new sprinkler system and a new fire alarm system in Building No. 22 at La Guardia Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 12, 1956, at which time and place said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 24, 1956

OFFICIAL PROPOSALS

Bids: June 19, 1956

Reinforcing Water Main

NOTICE TO BIDDERS
CITY OF NIAGARA FALLS, NEW YORK
56th ST. - PINE AVE.

Sealed proposals will be received by the City Manager of Niagara Falls, New York, at his office in said City not later than 10:00 A.M., Eastern Daylight Time on June 19, 1956, at which place and hour they will be publicly opened and read, and a contract awarded as soon thereafter as practicable, for the construction of approximately 6,300 feet of 42-inch and 6,100 feet of 36-inch water main in the City of Niagara Falls.

The work included under this Contract comprises the furnishing, installing, and testing of a 42-inch and 36-inch cast iron or reinforced concrete water main from the Water Treatment Plant at 53rd Street and Buffalo Avenue to Hyde Park Boulevard at Pine Avenue, in City property and in easements, with connections to existing mains and all appurtenant work.

All work shall be in accordance with the Instructions to Bidders, Proposal, Agreement, Specifications, Form of Performance Bond, and Plans on file at the office of the City Engineer, City Hall, Niagara Falls, New York, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained from the City Engineer or from Greeley and Hansen upon the deposit of $20.00 for each set. The amount of the deposit will be refunded if the Documents are returned in good condition within 30 days after the opening of bids.

A bank draft or certified check, in the amount of not less than five per cent of the total of the bid, made payable, at sight, to the City Manager, Niagara Falls, New York, must accompany each proposal.

The successful bidder will be required to furnish a Performance Bond approved by the Corporation Counsel in the amount of 100 per cent of the contract price.

The City reserves the right to waive any informalities in or reject any or all bids and to accept the bid which it deems most favorable to its interest, after all bids have been examined and canvassed.

CITY OF NIAGARA FALLS
(Signed) Charles B. Wright
City Manager

Dated: May 16, 1956.

Bids: June 7, 1956

New York State Road Work

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A. M., Eastern Daylight Saving Time, on June 7, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON OGDENSBURG ARTERIAL, ALTERNATE ROUTE 37, TOWNSHIPS OF OSWEGATCHIE AND LISBON CITY OF OGDENSBURG, ST. LAWRENCE COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-88

Maps, plans and specifications may be examined and obtained at the following offices.

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. W. C. Bassette, Acting Dist. Engr., 444 Van Duzee Street, Watertown, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.
The Engineer's estimate of cost for this work is $20,800.
Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1040. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."
The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: June 7, 1956

Channel Improvements

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Public Buildings Law, sealed proposals will be received until 10:30 A.M., Daylight Saving Time, on June 7, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract F.C. 56-1 for
Channel Improvement,
Newton Creek, Bainbridge,
Chenango County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor,
The Gov. Alfred E. Smith State Office Bldg., Albany, New York

(b) Mr. Joseph C. Federick, District Engineer,
71 Frederick Street, Binghamton, New York.

(c) Department of Public Works, 270 Broadway, New York City, N. Y.

The deposit for Plans and Proposal Forms is $15.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund of all other sets in good condition, similar period, will be 50% of deposit.
Engineer's Estimate of Cost for this contract is $247,500.00.
Each proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law and Public Buildings Law, as set forth in "Instruction to Bidders".
The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: June 19, 1956

Contract BP-120.001

RE-ADVERTISEMENT
THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER NO. 11
DEMOLITION OF PIERS 35 & 36—
DREDGING, BULKHEAD AND FILL

Sealed proposals for demolition of Piers 35 and 36, dredging and construction of a bulkhead and fill for proposed Pier 11 at Atlantic Basin, Brooklyn, New York, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 19, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $30,000 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 24, 1956.

Bids: June 13, 1956.

Office & Garage Buildings

Sealed bids addressed to the Public Works Commissioner of the State of Conn. for: Item #81, Office & Garage Buildings, Highway Depart., Wethersfield, Conn. Project—CP-S-42. Dwgs & Specs ready—May 14, 1956. Bid Opening—June 13, 1956. Deposit required—$100.00**, will be received in Room 491, State Office Building, Hartford, Conn., until 2:30 P.M., E.D.T., and thereafter publicly opened and read aloud in Room 558. Performance and Payment Bonds to be furnished by the bidder awarded the contract shall be in an amount not less than 100% of the contract price. The Commissioner reserves the right to waive technical defects or to reject any and all bids.
As Security, each bid must be accompanied by a Certified Check or a Cashier's Check drawn upon either a State Bank and Trust Company or a National Banking Association located in this State, for an amount not less than 5 per centum of the bid.
Drawings and Specifications may be obtained in Room 469, State Office Building, or by addressing such requests to the Commissioner of Public Works.
**In event the drawings and specifications are not returned within fifteen (15) days after the date of bid opening, the deposit will be automatically forfeited.
Condition of bidding on Item #81: the names of sub-contractors for the sub-divisions of the work listed in the Proposal Form must be stated in the Proposal. Failure to list the names of the sub-contractors required by the Proposal Form shall result in the rejection of the entire Proposal.

T. J. MURPHY, JR.—COMMISSIONER
PUBLIC WORKS DEPARTMENT

U. S. Government

United States Department of Commerce, Bureau of Public Roads, May 7, 1956. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2 p.m., e.d.t., June 21, 1956 for construction of Nicaragua Project 5-A, consisting of 10 bridges between Rivas and Penas Blancas on the Inter-American Highway in Nicaragua. Bidders will be limited to United States or Nicaragua firms with a satisfactory record of performance on construction in the United States of America or in the Republic of Nicaragua. The approximate quantities of the major items of work are: Unclassified Structural, Excavation 6200 cu. yds., Class "A" Concrete 3120 cu. yds., Reinforcing Steel 451,000 lbs., Structural Steel 596,000 lbs. All material, equipment, and supplies used in the construction of this project must be products of the United States or of the Republic of Nicaragua, unless otherwise authorized. Bureau of Public Roads Specifications FP-41 will apply. Plans, Specifications and Proposal Forms are available upon request at the address given above, or at the Inter-American Highway District Office, Bureau of Public Roads, 516 Avenida Roosevelt, Managua, Nicaragua. C. D. Curtiss, Commissioner.

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RATE: $2.10 per line (or fraction) per insertion.

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The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

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Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

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Soils Engineer. Soils work in connection with foundations of bridges, buildings, highway and miscellaneous structures, also testing and control of placement of earth fills for highway and railway project. Prefer associated ability in civil or structural design engineering. For Midwest consulting firm. Salary $6,000-$8,000 plus overtime and benefits. Sverdrup & Parcel, Inc., Engineers-Architects, 915 Olive, St. Louis 1, Mo.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems; also, architects for preparation of plans for general building work. State experience, age, salary required, when can report, and give references. Reply P-1800, Engineering News-Record.

Project Engineer with estimating ability and management potential for main office of Midwestern General Contractor, permanent position with growing organization. State experience, age, salary, when can report and references. P-1668, Engineering News-Record.

Building Construction Superintendent for Mid-west General Contractor in heavy industrial and institutional construction; growing organization. State experience, age, salary, when can report and references. P-1671, Engineering News-Record.

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Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8890, Engineering News-Record.

(Continued on page 116)

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College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

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P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

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P-1712, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

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P-1821, Eng. News-Record, 330 W. 42 St., N. Y. 36

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P-1540, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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P-1825, Engineering News-Record
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Good rate plus overtime for experienced men. Send experience history, references, availability and salary wanted in first letter.

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P-1726, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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POSITIONS VACANT
(Continued from page 113)

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Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

Graduate Civil Engineer. Good future for energetic individual. Vacation and Welfare insurance. Salary $5,000. Location Central Illinois. No experience required. P-1815, Engineering News-Record.

Chief estimator with well established Central Pennsylvania General Contractor. Send full information on experience, education, date available and salary requirements. We are mainly interested in industrial, commercial and institutional work. P-1816, Engineering News-Record.

Materials Engineers in several grades wanted by Mid-West consultants. Must know construction materials testing and inspection, including field control soils, and concrete. Furnish resume, salary requirements, availability, first letter. P-1840, Engineering News-Record.

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Construction Executive-41-project manager, gen. supt., estimator. Reg. C.E., 20 year proven record. Special qualifications in organization and planning difficult work. Available for association with gen. contractor, Southeast. Opportunity and $14,000. PW-1742, Engineering News-Record.

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Construction superintendent, over 20 yrs. broad experience, industrial, institutional and commercial projects. Anywhere. Engineer. Minimum salary $200. PW-1768, Engineering News-Record.

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Construction Executive, thoroughly experienced industrial, commercial construction—all phases building industry: estimating, buying, field management. PW-1826, Engineering News-Record.

Lt(jg), Civil Engineer Corps, USNR, age 26, P.E., BCE, available July. 2 years constr. project engineer; 1 year plant maintenance, management, contracts. Desire firm in S.E. PW-1785, Engineering News-Record.

Sewer Foreman, Middle Age, Italian, with lifelong experience on interceptor and lateral sewers, desires permanent connection with ambitious contractor interested in paying a salary plus a profit sharing plan. PW-1802, Engineering News-Record.

SEARCHLIGHT SECTION
(Continued on pages 117-118)

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Face Up to Rapid Transit

THE GREAT NEED FOR BETTER HIGHWAYS, which has focused attention on means to assure their early construction, has tended to obscure the fact that, in many large cities, the motor vehicle by itself can never supply the transportation required to move people about. Rapid mass transit by rail must be resorted to when street capacity and parking space for motor cars run out—a time which is too close at hand for comfort.

Unfortunately, rapid transit is not a paying business, and all recent studies of proposed systems have shown that some sort of subsidy will be required. In New York, San Francisco and Los Angeles, rapid transit planning is at a temporary standstill because of this fact.

The real trouble seems to stem from the insistence to regard rapid transit as a self-liquidating business instead of a municipal service. Taxpayers don't balk at a 100% "subsidy" for city streets, but providing a partial subsidy for rapid transit is somehow considered to be wrong. Engineers have a responsibility to help change this attitude. Both they and the general public must face up to the necessity for rapid transit, and get programs under way before irreparable harm is done to city development.

Pollution Control Stimulated

A SUBSTANTIAL CONTRIBUTION TO PROGRESS in the pollution control field has been made by the California State Water Pollution Control Board in establishing standards for discharge of Los Angeles sewage (ENR, May 10 p. 28). The contribution is not wholly in the type and nature of the requirements, interesting as some of these are, but rather in the fact that the decision should go a long way to prove whether or not the California concept of pollution control is sound. Although established several years ago, this concept has not yet been put to a thorough test.

Briefly the California setup involves a state board and a number of regional boards. Substantial control is in the hands of the regional boards, which include representatives of industry, agriculture, water and sewerage agencies and the like. Only when a regional board's ruling is appealed—as it was for the first time in the Los Angeles case—does the state board step in and prescribe discharge requirements.

The other important aspects of the California concept are that the requirements shall take into account all beneficial uses of the receiving waters, and that the rulings shall stipulate end result only and not the method of achieving it.

The regional boards have been doing a good job, but many believe not good enough. And there has been some danger that the entire concept would be changed before it had been thoroughly tested.

The new ruling by the state board differs from previous regional board rulings in three ways. Its requirements are definite and exact, and not couched in general terms. A system of monitoring the receiving water is established so there can be no doubt whether or not the requirements are met. And the waters of Santa Monica Bay are divided into areas with definite beneficial uses, for example, one is for waste dispersion and dilution, while another is primarily for recreational purposes—swimming, skin diving, sunbathing and the like.

Determining whether or not these types of rulings will work will be a great contribution to pollution control generally. Already, however, their definite and positive nature has given pollution control in California a very useful stimulus. With that bolstering there will be a better long-range opportunity to test thoroughly the soundness of the entire program in the Golden State.

Too Costly Right-of-Way

THE DECISION of the Maryland State Road Commission to abandon one of its highway dualization projects because of the exorbitant prices being put on needed right-of-way by land owners (ENR Mar. 1, p. 77) will be sympathetically noted in other highway departments across the country. The mounting cost of rights-of-way is cutting down seriously on the amount of new highways that can be built with the available money, and drastic steps are necessary to bring that fact to wide public attention.

The condemnation laws that are on the statute books of all states were written to check the attempts of individuals to obtain unreasonable prices for land needed for public purposes. But they have in large part been nullified by the tendency of juries to award high compensation where highway departments resort to condemnation proceedings. And the long delays in handling condemnation cases in the courts add to the cost.

Consequently, there is no easy or quick solution for this problem. It appears to be one calling for progressively bringing the general public to realize that land costs have become a major factor in highway building and that, if the nation is to get the highways it needs within a reasonable time, payments for land needed for new roads must be kept within reasonable limits. Possibly judges could help bring about such an approach to this problem by impressing on jury members their responsibility to the public as well as to the citizen whose land is being taken.

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Going up . . . one apartment house, fourteen floors high, in Cleveland, Ohio. The transit mixer is a Blaw-Knox. It is powered with a Chrysler Ind. 30—230 cubic inch displacement engine.

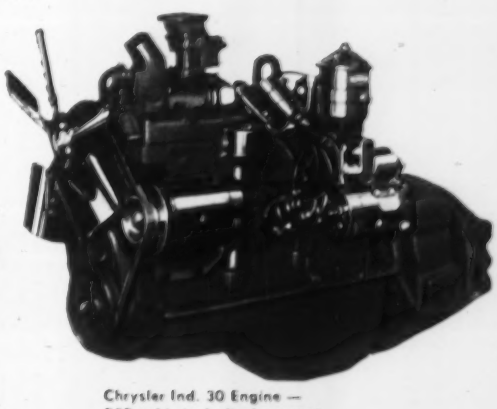
Most modern transit mixers are Chrysler-powered and equipped with Chrysler gýrol Fluid Coupling. And there is good reason for the popularity of this Chrysler combination.

In the first place; Chrysler Industrial Engines are heavy-duty, high-speed engines . . . constructed of heavy-duty components. Yet, thanks to Chrysler research in metallurgy, they are compact, lightweight engines, easily installed in modern equipment.

Secondly, gýrol Fluid Coupling—the other half of the Chrysler combination—absorbs the wear and-tear imposed by power impulses, sudden starts and stops. The result is 100% *longer life for clutch, transmission and equipment itself.*

Finally, like other manufacturers of self-powered equipment, transit mixer manufacturers recognize the initial economy of installing Chrysler Industrial Engines. They know that Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

Learn more about the advantages of Chrysler Industrial Power for your equipment. See a nearby Chrysler Industrial Engine Dealer or write direct: **Dept. 65, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**



Chrysler Ind. 30 Engine — 230 cubic inch displacement

HORSEPOWER WITH A PEDIGREE

Chrysler

INDUSTRIAL ENGINES

Industrial Engine Division • Chrysler Corporation

Has power to push the biggest loads –has TIMKEN® bearings to take 'em

RADIAL and thrust loads on vital moving parts are tremendous in this 40,125 lb. Galion Motor Grader, the world's biggest, as it pushes tons of earth at a clip. To take the heavy loads and keep the giant machine working smoothly and steadily, Galion Iron Works engineers specified Timken® tapered roller bearings for the front wheels, steering gear, circle reverse case, side shift case, tandem drive case and final drive.

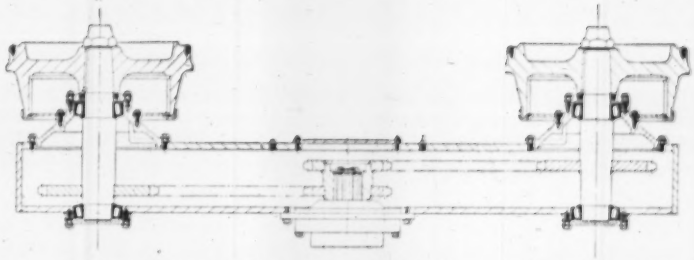
Timken bearings take radial and thrust loads in any combination. It's the tapered construction that does it. And full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. Shafts are held in rigid alignment. Gears mesh smoothly. Shafts and housings stay concentric making closures more effective. The machine keeps on the go with less wear, less maintenance.

Timken bearings take the shocks of rutted, uneven ground, too. That's because Timken bearing rollers and races have tough, shock-resistant cores under hard, wear-resistant surfaces. Longer bearing and machine life are assured.

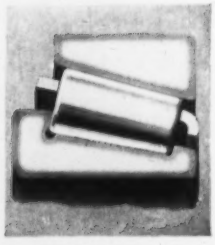
Timken bearings roll the heavy load smoothly—don't slide it. They practically eliminate friction. Timken bearings are designed by geometrical law to have true rolling motion and manufactured with microscopic accuracy to conform to their design.

Only Timken bearings give you so many advantages. Make sure you get them; always specify Timken bearings for the machines you design, buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **GALION IRON WORKS & MFG. CO.**, Galion, Ohio, uses Timken bearings in the tandem rear wheels of T-700 Motor Grader to take heavy loads, reduce friction, assure trouble-free, dependable performance.



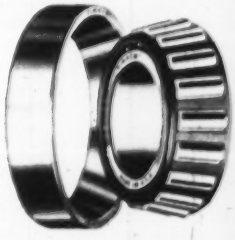
GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

TIMKEN

TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION